Appendix 9

Meadowbank and Whale Tail 2020 Annual Geotechnical Inspection

CONFIDENTIAL

REPORT

2020 Annual Geotechnical Inspection

Meadowbank Complex, Nunavut

Submitted to:

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Executive Summary

Agnico-Eagle Mines Ltd (AEM) has mandated Golder Associés Ltée (Golder) to carry out the 2020 geotechnical inspection of the Meadowbank mining complex, including the Meadowbank and Whale Tail Project sites, in accordance with the requirements of the water licence (No. 2AM-MEA0815). The inspection was carried out from July 13 to 22, 2020 and concerned the geotechnical aspects and the review of the instrument data available for the dewatering dikes, the structures of the tailings pond (TSF), the structures of the all-season access road (AWAR) located between the Meadowbank site and the town of Baker Lake, as well as the road between the Meadowbank and Whale Tail Project sites (Whale Tail Project road), the fuel storage infrastructures at the Meadowbank site, the Whale Tail Project site and Baker Lake, the other site infrastructures such as the pumping ramp of the attenuation pond, the diversion ditches and surface water management infrastructures, the access roads, the landfill, the contaminated soil storage area (landfarm), the wastewater management pond (Stormwater Pond), the RSF till plug, the diffusers, the erosion and sediment protection structure, the airstrip as well as the crusher retaining wall.

Based on observations collected during the inspection, as well as instrumentation data, the condition of the dewatering dikes is satisfactory. It is recommended to report piezometers that have recorded data below 0 ° C in the past on East Dike and Bay-Goose Dike and be very careful in interpreting their data, as they may be damaged. Once a piezometer has frozen, it is no longer completely reliable even if it thaws.

It is recommended that a sufficient distance be maintained between the ultramafic waste rock pile and the downstream toe of South Camp Dike to allow adequate visual observation of the downstream toe area.

The subsidence and tension cracks observed in 2013 and 2014 on the upstream side of the thermal cover of Bay-Goose Dike were still visible but no longer appear to be active. Water accumulation at the downstream toe and flow from the downstream side of Bay-Goose Dike to Bay-Goose pit should continue to be monitored. Flow areas identified as North Channel, Channel 1, and Channel 3 should be carefully monitored as instrumentation data and field observations seem to indicate that flow is occurring in these areas but is draining directly into the pit instead of accumulating at the downstream toe of the dike. The flow of the Central Channel area should continue to be monitored.

The dewatering dikes at the Whale Tail Project site (Whale Tail Dike, WRSF Dike, Mammoth Dike, North-East Dike) were in good condition during inspection.

Seepage through the foundation of Whale Tail Dike, which is measured in the downstream collection trench, reached a maximum of 90 m^3/h compared to a maximum of 300 m^3/h before the injection works conducted in 2019/2020. The remaining seepage is managed by redirecting it by gravity to the attenuation pond and a pumping system is in place to intercept the seepage, although it is not currently active. Monitoring of the instrumentation data and seepage rates must continue in order to understand spatial and temporal evolution of the seepage.

Contrary to 2019, no seepage was observed in 2020 at the downstream toe of WRSF Dike. This is likely linked to the effectiveness of the thermal berm that was constructed in 2020 upstream of the dike, as well as the low upstream pond level management strategy that were part of AEM’s mitigation plan. Monitoring of the instrumentation data must continue to validate the effect of these measures on the foundation and assess its long-term thermal behaviour.

Based on the observations collected during the inspection, as well as the instrumentation data, the TSF structures generally are in good condition. The tailings beaches were adequate along the structures, with the exception of the south side of Central Dike and Saddle Dam 5, where shallow water was ponding, as well as the downstream side of the west end of the Stormwater Dike that separates the two TSF cells, where tailings are submerged.

No deformation was observed on Stormwater Dike in 2020. It is recommended to continue to monitor the potential movements of the Stormwater Dike and to follow the emergency measures plan in case of deterioration of the situation. The presence of water against the downstream toe of this dike is geotechnically acceptable.

Traces of erosion and tension cracks are present in the fine filter material of the North Cell Internal Structure, including a location where superficial sloughing exposed the underlying coarse filter. It is recommended to repair these deformations to restore the integrity of the filter system, which is in progress.

A water pond is present at the downstream toe of Central Dike. This accumulation of water is fed by an underground flow which is partly connected to the south cell of the TSF. During the inspection, the accumulation of water was observed at the downstream toe of the dike, approximately between Sta. 0 + 300 and the southern access road at Sta. 0 + 830. The water was orange in color with high turbidity earlier in the season, similarly to previous years. At the time of inspection, an average seepage rate of approximately 110 m^3/h was being pumped to the South Cell of the TSF to maintain the downstream pond level at El. 115 m.

Most of the AWAR culverts were in good condition. It is recommended that special attention be paid to culverts R-00A (2 + 550), PC-14 (4 + 260), the unidentified culvert at kilometre 5 + 700, PC-1 (9 + 952), and the culvert PC-16 (54 + 950). If insufficient capacity to manage runoff is observed at the time of the spring freshet, then it would be recommended to clear the obstructions or repair the culverts. It is also recommended to monitor the progress of erosion of culverts PC 17A (8 + 830), PC-11 (39 + 552), R14 (67 + 840), R18-B (82 + 500), R-20 (85 + 490), R-23 (93 + 600) and R24 (98 + 100) during the spring freshet, since there are signs of water flow below the road at these locations. If the condition of these culverts continues to deteriorate due to erosion, it is recommended that they be repaired. The bridges along the AWAR were in good geotechnical condition. Bridge 1 has a deformation of the metal panels of the two abutments. Signs of settlement were observed at Bridge 6, R15. The bridge sloped towards the west side of the two abutments. The foundation of the bridge showed no signs of deterioration. Remediation work is not required at this time, however, the situation should be monitored.

The presence of unstable blocks and loose rocks along steep walls is still observed in quarries 3, 7, 9, 10, 16, 18 and 23 along the AWAR. It is recommended to workers to use caution in these quarries and for AEM to inform them of the potential hazards.

The culverts on the Whale Tail Project road were in good condition. It is recommended to pay special attention to culverts # 5 (117 + 525), # 7 (118 + 013), # 7 2 (118 + 016), # 13 (120 + 615), # 27-2 (123+ 300), # 45 (125 + 710), # 48 (127 + 203), # 54 (128 + 388), # 55 (128 + 440), # 64 (129 + 920), # 65 (130 + 924) , # 83 (136 + 300), # 85 (136 + 671), # 86 (136 + 740), # 88 (136 + 861), # 89 (137 + 180), # 93 (138 + 100), # 97 (138 + 436), # 98 (138 + 482), # 101 (139 + 025), # 105 (140 + 555), # 112 (142 + 630), # 113 (142 + 736), # 115 (142 + 865), # 116 (142 + 940), # 117 (143 + 173), # 118 (143 + 433), # 133 (148 + 141), # 150 (152 + 171 to 152 + 179), # 151 (152 + 562), # 160 (155 + 966), # 163 (156 + 474), # 192 (163 + 190), # 234 (170 + 385), # 241 (171 + 235), # 268 (175 + 774), # 278 (177 + 870), # 283 (178 + 965), # 284-2 (179 + 072). If insufficient capacity to manage runoff is observed at the time of the spring freshet, then it would be recommended to clear the obstructions or repair the culverts. It is also recommended to monitor the erosion progress of culverts # 167 (41 + 843) and # 232 (53 + 928), since there are signs of water flow below the road at these locations. Culvert erosion should be

monitored during the spring freshet. The bridges along the Whale Tail Project road were in good geotechnical condition. The crack observed in 2019 in the concrete of the northwest abutment of Bridge 160.8 (160 + 800) is stable.

During the inspection, all the quarries and eskers along the Whale Tail Project road were dry except for esker # 2 and quarry 168. Unstable and loose rocks along steep walls and unstable ground slopes were observed in all quarries and eskers except eskers # 3, # 5 and # 6. It is recommended that workers be cautious at these locations and AEM advise them of the dangers of falling boulders or potential slope failures.

The fuel storage infrastructure at the Whale Tail Project site was in good condition.

Water accumulation was observed in several areas of the Baker Lake fuel storage infrastructure and at the Meadowbank main camp site. The disposal of fluids accumulated in secondary containment infrastructure should be managed so as to minimize the amount of water in contact with the base of the tanks. A fold in the geomembrane was observed in the northeast corner of tank 4. It is recommended to cover the exposed area with a geotextile and backfill material to restore the protection of the geomembrane. Tension cracks were observed at the top of the slope north of tank 5, accompanied by signs of settlement in the granular material used to cover the previously exposed membrane. The area should be monitored and repaired as necessary to protect the geomembrane.

A hole in the exposed geomembrane was repaired at the Baker Lake site at the south-southwest corner of Tank 3 at the toe of the slope. The exposed area should now be covered with geotextile and backfill material to restore the protection of the geomembrane. Animal burrows have been observed at the Baker Lake site near the south side of tanks 3 and 4. It is recommended to assess whether the underlying geosynthetics have been damaged.

The geomembrane of the twenty Jet A fuel tanks at the Baker Lake site remains exposed. The geomembrane has a tear in the southwest corner of the tanks. The tear should be repaired as the accumulated water is close to the level of the hole. It is recommended to remain vigilant during the spring freshet and throughout the year in order to manage the accumulation of water in the containment area.

It is recommended to monitor the performance of the five culverts installed in the Vault road during the spring freshet. A set of two culverts is installed between lakes NP1 and NP2 near the Meadowbank site; these culverts have been repaired. Another set of three culverts is installed further down the road to the Vault pit, and these culverts are all partially collapsed in the middle.

The Meadowbank West and East Diversion ditches and their sediment control elements, as well as the Whale Tail Project site Diversion ditches, were in good condition. It is important to inspect them during the spring freshet.

The diffusers, the landfill, the contaminated soil storage area (landfarm), the wastewater management pond (Stormwater Pond), the airstrip and the crusher retaining wall at Meadowbank, as well as the attenuation pond ramp at the Whale Tail Project site, were in good condition.

Sommaire exécutif

Agnico-Eagle Mines Ltée (AEM) a mandaté Golder Associés Ltée (Golder) pour réaliser l'inspection géotechnique 2020 du complexe minier Meadowbank, incluant les sites de Meadowbank et Whale Tail Project, en conformité avec les exigences du permis d'utilisation des eaux d'AEM (licence No. 2AM-MEA0815). L'inspection a été réalisée du 13 au 22 juillet 2020 et concernait les aspects géotechniques et la revue des données d'instruments disponibles pour les digues d'assèchement, les structures du parc à résidus (PAR), les structures de la route privée toute saison (AWAR) située entre le site de Meadowbank et la ville de Baker Lake, ainsi que la route de Whale Tail Project, les infrastructures d'entreposage du carburant au site de la Mine, au site de Whale Tail Project et à Baker Lake, de même que les autres infrastructures du site telles que la rampe de pompage de l'étang d'atténuation, les fossés de dérivation et infrastructures de gestion des eaux de surface, les routes d'accès, la zone d'entreposage de matières résiduelles, la zone d'entreposage de sols contaminés, l'étang de gestion des eaux usées (Stormwater Pond), le till de colmatage de la halde à stériles (RSF), les diffuseurs, la structure de protection contre l'érosion et les sédiments, la piste d'atterrissage ainsi que le mur de soutènement du concasseur.

Basée sur les observations collectées lors de l'inspection, ainsi que les données d'instrumentation, la condition des digues d'assèchement est satisfaisante. Il est recommandé de signaler les piézomètres qui ont enregistré des données à une température inférieure à 0 °C par le passé aux digues East Dike et Bay-Goose Dike et d'être très prudent lors de l'interprétation de leurs données, car ils pourraient être endommagés. Une fois qu'un piézomètre a gelé, il n'est plus totalement fiable même s'il dégèle.

Il est recommandé de conserver une distance suffisante entre la pile de roches stériles ultramafiques et le pied aval de la digue South Camp Dike afin de permettre une observation visuelle adéquate de la zone du pied aval.

L'affaissement et les fissures de tension observés en 2013 et 2014 du côté amont de la couverture thermique de la digue Bay-Goose Dike étaient encore visibles, mais ne semblent plus actifs. L'accumulation d'eau au pied aval et l'écoulement du côté aval de la digue Bay-Goose Dike vers la fosse Bay-Goose doivent continuer à être surveillés. Les zones d'écoulement identifiées comme North Channel, Channel 1 et Channel 3 doivent être rigoureusement surveillées, car les données d'instrumentation et les observations de terrain semblent indiquer qu'un écoulement se produit dans ces zones, mais s'évacue directement dans la fosse au lieu de s'accumuler au pied aval de la digue. L'écoulement de la zone d'écoulement Central Channel doit continuer à être surveillé.

Les digues d'assèchement du site de Whale Tail Project (Whale Tail Dike, WRSF Dike, Mammoth Dike, North-East Dike) étaient en bonne condition lors de l'inspection.

Les exfiltrations à travers de la fondation de la digue Whale Tail Dike mesurées dans la tranchée de collecte en aval ont atteint un maximum de 90 m^3/h en 2020, comparé au maximum de 300 m^3/h observé avant les travaux d'injection réalisés en 2019/2020. Les exfiltrations restantes sont gérées par redirection gravitaire vers le bassin d'atténuation et un système de pompage est en place pour interception des exfiltrations, bien qu'il ne soit actuellement pas actif. Le suivi de l'instrumentation et des exfiltrations doit se poursuivre afin de comprendre l'évolution spatiale et temporelle des exfiltrations.

Contrairement à 2019, aucune exfiltration n'a été observée en 2020 au pied aval de la digue WRSF Dike. Ceci est vraisemblablement attribuable à l'efficacité de la berme thermique construite en 2020 en amont de la digue, ainsi que de la stratégie de maintien d'un niveau d'eau bas dans le réservoir en amont inclus dans le plan de mitigation d'AEM. Le suivi des instruments doit se poursuivre pour valider l'effet de ces mesures sur la fondation et évaluer le comportement thermique de celle-ci à long terme.

Sur la base des observations collectées lors de l'inspection, ainsi que les données d'instrumentation, les structures du PAR sont en bonne condition de façon générale. Aucune déposition de résidus n'avait été réalisée au PAR depuis l'inspection précédente. La plage de résidus était adéquate tout le long des structures, à l'exception du côté sud de Central Dike et Saddle Dam 5 où une faible profondeur d'eau a été observée, ainsi que du côté aval de l'extrémité ouest de la digue Stormwater Dike qui sépare les deux cellules du PAR, où les résidus sont submergés. .

Aucune déformation n'a été observée sur Stormwater Dike en 2020. Il est recommandé de continuer à surveiller les mouvements potentiels de la digue Stormwater Dike et de suivre le plan de mesures d'urgence en cas de détérioration de la situation. La présence d'eau le long du pied aval est acceptable d'un point de vue géotechnique pour cette digue.

Des traces d'érosion et des fissures de tension sont présentes dans le matériau de filtre fin de la digue *North Cell Internal Structure*, incluant un emplacement où un glissement de surface a exposé le filtre grossier sous-jacent. Il est recommandé de réparer ces déformations pour restaurer l'intégrité du filtre, ce qui est en cours de réalisation.

Un étang d'eau est présent au pied aval de la digue Central Dike. Cette accumulation d'eau est alimentée par un écoulement souterrain qui est relié en partie à la cellule Sud du PAR. Lors de l'inspection, l'accumulation d'eau a été observée au pied aval de la digue, approximativement entre le chaînage 0+300 et le chemin d'accès sud au chaînage 0+830. L'eau avait une coloration orange avec une forte turbidité plus tôt dans la saison, comme au cours des années précédentes . Au moment de l'inspection, un taux d'exfiltration moyen d'approximativement 110 m^3/h était pompé vers la Cellule Sud du PAR pour maintenir le niveau de l'étang d'eau au pied aval à l'Él. 115 m.

Les ponceaux de l'AWAR étaient pour la plupart en bonne condition. Il est recommandé de prêter une attention particulière aux ponceaux R-00A (2+550), PC-14 (4+260), au ponceau non identifié au kilomètre 5+700, PC-1 (9+952), et au ponceau PC-16 (54+950). Si une capacité insuffisante à gérer les écoulements est observée au moment de la crue printanière, il serait alors recommandé de dégager les obstructions ou de réparer les ponceaux. Il est également recommandé de suivre la progression de l'érosion des ponceaux PC-17A (8+830), PC-11 (39+552), R14 (67+840), R18-B (82+500), R-20 (85+490), R-23 (93+600) et R24 (98+100) lors de la crue printanière, puisqu'il y a des signes d'écoulement d'eau en dessous de la route à ces emplacements. Si la condition de ces ponceaux continue à se détériorer en raison de l'érosion, il est recommandé de les réparer. Les ponts le long de l'AWAR étaient en bonne condition géotechnique. Le Pont 1 comporte une déformation des panneaux métalliques des deux culées. Des signes de tassement ont été observés au Pont 6, R15. Le pont s'inclinait vers le côté ouest des deux culées. La fondation du pont ne montrait pas de signe de détérioration. Il n'est pas requis d'effectuer des travaux de remédiation pour le moment, cependant la situation doit être surveillée.

La présence de blocs instables et de roches meubles le long de parois raides est encore observée dans les carrières 3, 7, 9, 10, 16, 18 et 23 situées le long de l'AWAR. Il est recommandé aux travailleurs d'être prudents dans ces carrières et à AEM de les informer des dangers potentiels.

Les ponceaux de la route de Whale Tail Project étaient en bonne condition. Il est recommandé de prêter une attention particulière aux ponceaux #5 (117+525), #7 (118+013), #7-2 (118+016), #13 (120+615), #27-2 (123+300), #45 (125+710), #48 (127+203), #54 (128+388), #55 (128+440), #64 (129+920), #65 (130+924), #83 (136+300), #85 (136+671), #86 (136+740), #88 (136+861), #89 (137+180), #93 (138+100), #97 (138+436), #98 (138+482), #101 (139+025), #105 (140+555), #112 (142+630), #113 (142+736), #115 (142+865), #116 (142+940), #117 (143+173), #118 (143+433), #133 (148+141), #150 (152+171 to 152+179), #151 (152+562), #160 (155+966), #163 (156+474), #192 (163+190), #234 (170+385), #241 (171+235), #268 (175+774), #278 (177+870), #283 (178+965), #284-2 (179+072). Si une capacité insuffisante à gérer les écoulements est observée au moment de la crue printanière, il serait alors recommandé de dégager les obstructions ou de réparer les ponceaux. Il est également recommandé de suivre la progression de l'érosion des ponceaux #167 (41+843) et #232 (53+928), puisqu'il y a des signes d'écoulement d'eau en dessous de la route à ces emplacements. L'érosion des ponceaux devrait être suivie lors de la crue printanière. Les ponts le long de la route de Whale Tail Project étaient en bonne condition géotechnique. La fissure observée en 2019 dans le béton de la culée nord-ouest du Pont 160.8 (160+800) est stable.

AWARLors de l'inspection, toutes les carrières et les eskers situés le long de la route de Whale Tail Project étaient secs, à l'exception de l'esker #2 et de la carrière 168. Des roches instables et meubles le long de parois raides et des pentes de sol instables ont été observées dans toutes les carrières et les eskers, à l'exception des eskers #3, #5 et #6. Il est recommandé aux travailleurs d'être prudents à ces emplacements et à AEM de les informer des dangers de chute de blocs ou de ruptures de pente potentiels.

Les infrastructures d'entreposage de carburant du site de Whale Tail Project étaient en bonne condition.

Une accumulation d'eau a été observée dans plusieurs zones de l'infrastructure d'entreposage de carburant de Baker Lake et au site du camp principal de Meadowbank. L'évacuation des fluides accumulés dans les infrastructures de confinement secondaire devrait être gérée de sorte à minimiser la quantité d'eau en contact avec la base des cuves. Un pli dans la géomembrane a été observé dans le coin nord-est de la cuve 4. Il est recommandé de couvrir la zone exposée avec un géotextile et un matériau de remblai pour rétablir la protection de la géomembrane. Des fissures de tension ont été observées au sommet du talus au nord de la cuve 5, accompagnées de signes de tassement dans le matériau granulaire utilisé pour recouvrir la membrane précédemment exposée. La zone devrait être surveillée et réparée au besoin pour protéger la géomembrane.

Un trou dans la géomembrane exposée a été réparé au site de Baker Lake au coin sud-sud-ouest de la cuve 3 au pied de la pente. La zone exposée devrait maintenant être couverte avec un géotextile et du matériau de remblai pour rétablir la protection de la géomembrane. Des terriers d'animaux ont été observés au site de Baker Lake à proximité du côté sud des cuves 3 et 4. Il est recommandé d'évaluer si les géosynthétiques sous-jacents ont été endommagés.

La géomembrane des vingt cuves de carburant Jet A au site de Baker Lake demeure exposée. La géomembrane comporte une déchirure au coin sud-ouest des cuves. La déchirure devrait être réparée, car l'eau accumulée est proche du niveau du trou. Il est recommandé de rester vigilant lors de la crue printanière et tout au cours de l'année afin de gérer l'accumulation d'eau dans l'aire de confinement.

Il est recommandé de suivre la performance des cinq ponceaux installés dans la route de Vault lors de la crue printanière. Une série de deux ponceaux est installée entre les lacs NP1 et NP2 à proximité du site de Meadowbank; ces ponceaux ont été réparés. Une autre série de trois ponceaux est installée plus loin sur la route vers la fosse Vault, et ces ponceaux sont tous trois partiellement effondrés au milieu.

Les fossés de dérivation Ouest et Est de Meadowbank et leurs éléments de contrôle des sédiments, ainsi que les fossés de dérivation du site de Whale Tail Project, étaient en bonne condition. Il est important de les inspecter durant la crue printanière.

Les diffuseurs, la zone d'entreposage des matières résiduelles, la zone d'entreposage des sols contaminés, l'étang de gestion des eaux usées (Stormwater Pond), la piste d'atterrissage et le mur de soutènement du concasseur à Meadowbank, ainsi que la rampe de l'étang d'atténuation de Whale Tail Project étaient en bonne condition.

Study Limitations

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1.0 INTRODUCTION

Agnico-Eagle Mines Limited's (AEM) Meadowbank Complex mandated Golder Associés Ltée (Golder) to conduct the 2020 annual geotechnical inspection, pursuant to the requirement of Type A Water Licence Permit No. 2AM-MEA0815 for the Meadowbank Complex, Nunavut, including the Meadowbank and Whale Tail Project sites.

Under Part I, Item 12 (pages 23 and 24), AEM is required to undertake an annual geotechnical inspection of its facilities between the months of July and September.

The following structures were covered at the Meadowbank site by the inspection:

- Dewatering dikes (East Dike, South Camp Dike, Bay-Goose Dike and Vault Dike)
- Tailings storage facilities (Stormwater Dike, Saddle Dam 1, Saddle Dam 2, Saddle Dam 3, Saddle Dam 4, Saddle Dam 5, Central Dike and the North Cell Internal Structure).
- South Cell pond and North Cell pond (reclaim ponds).
- Geotechnical instrumentation.
- All-Weather Access Road (AWAR) and site roads (culverts and bridges at water crossings in particular).
- Quarries on site and along the AWAR.
- Landfill and contaminated soil storage and bioremedial landfarm facility.
- Bulk fuel storage facilities at the mine site and in Baker Lake.
- Shoreline protection.
- Sediment and erosion control structures.
- Other structures: sumps, airstrip, Waste Rock Storage Facility (WRSF) till plug, Stormwater pond, diversion ditch.

The following structures were covered at the Whale Tail Project site by the inspection:

- Dewatering and water management dikes (Whale Tail Dike, WRSF Dike, North-East Dike and Mammoth Dike).
- Dewatering ramp and attenuation pond.
- Geotechnical instrumentation.
- Whale Tail Project Road and site roads (culverts and bridges at water crossings in particular).
- Quarries and eskers along the Whale Tail Project Road.
- Bulk fuel storage facilities.
- Shoreline protection and diffusers.
- Sediment and erosion control structures.
- Saline Ditch and South Whale Tail Channel.

- Other structures: sumps and non-contact water management infrastructures.

The 2020 geotechnical inspection was conducted from July 13 to 22 by Marion Habersetzer, a professional geotechnical engineer from Golder. During the inspection, the weather was rainy to sunny with daily temperatures varying between 10°C and 20°C. The inspection was scheduled at the time of year when the seasonal depth of thaw (active layer) is expected to be near its maximum. Surface water flow is generally low to moderate at this time of year. Peak water flows typically occur during the spring thaw (mid-June through mid-July).

This report describes the geotechnical aspects of the areas inspected and presents general observations and recommendations. Figure 1 shows the main mine site area.

1.1 Scope Limitations

The scope of the inspection is limited to the geotechnical aspects of each of the facilities listed in Section 1.0 above. The inspection did not include other assessments such as structural, mechanical or environmental. For additional information related to the limitations of this scope, reference should be made to the Study Limitations provided at the beginning of this report.

2.0 PRIORITY LEVEL DEFINITIONS FOR RECOMMENDATIONS

In this report, each recommendation is assigned a priority level. The ranking system is used to help AEM determine the priorities of the recommendations. The priority levels and descriptions are based on those in the Health, Safety, and Reclamation Code for Mines in British Columbia (Ministry of Energy and Mines 2017) and the associated Guidance Document.

The priority levels and descriptions presented in Table 1 are used in this document. It is recommended that the status of each recommendation be reported on in the next geotechnical safety system inspection for a follow-up and/or closeout, as appropriate. The recommendations are presented in each section below and summarized in Table 2 in the conclusion section. The term “structure” refers to any kind of geotechnical structure assessed during the geotechnical inspection, including dams, storage facilities, roads, bridges, and others.

Table 1: Priority Levels and Descriptions

Priority Level	Description
P-1	A high priority or actual structure safety issue considered immediately dangerous to life, health, or the environment; or a significant risk of regulatory enforcement.
P-2	If not corrected, could likely result in structure safety issues leading to injury, environmental impact, or significant regulatory enforcement; or a repetitive deficiency that demonstrates a systematic breakdown of procedures.
P-3	Single occurrences of deficiencies or non-conformance that alone would not be expected to result in structure safety issues.
P-4	Best Management Practice – further improvements are necessary to meet industry best practices or reduce potential risks.

3.0 MEADOWBANK DEWATERING DIKES

The dewatering dikes at Meadowbank include: East Dike, South Camp Dike, Bay-Goose Dike, and Vault Dike. East Dike has been in operation since the dewatering of the northwestern arm of Second Portage Lake was completed in 2009. Bay-Goose Dike and South Camp Dike became operational in July 2012 when the dewatering of the Bay-Goose Basin was completed. Construction of Vault Dike was completed in March 2013 and phase 2 of the dewatering of Vault Lake was completed in 2014.

The most current version of the OMS manual (AEM 2019a) is dated March 2019 for the Meadowbank dewatering dikes. The most current version of the overall Emergency Response Plan for the mine (AEM 2020) is dated June 2020. It is good practice to review these documents each year to keep the information up to date, particularly the 24-hour contact name and phone number.

A detailed visual inspection of the dewatering dikes is performed by AEM once a month. The monthly inspection reports were reviewed as part of the annual inspection. Most of the instruments on East Dike, South Camp Dike and Bay-Goose Dike are connected to a system that automatically collects and transmits data every three hours. Data for all instruments can be visualized on the software (VDV) and are checked regularly (every three days at a minimum) by the mine engineering team. A review of the instrumentation data for the Meadowbank dewatering dikes is presented in the following sections. During the year, daily review of the instrumentation on the dewatering dikes is done by mine personnel and quarterly reports summarizing their observations are issued internally. Reports for structures with a yellow Trigger Action Response Plan level are issued on a monthly basis. The compilation of the instrumentation data was not part of the scope of this study, and the figures showing the data were provided by AEM. The information provided by AEM is presented as received in Appendix C. The data were sent as figures for the dewatering dikes and as PowerPoint and Excel files for the Tailings Storage Facility (TSF) structures. This revised presentation is clearer than the previous one and allowed for a better interpretation of the instrumentation data. As a result, some interpretations including data trends and depth of active layers are slightly different from those in the inspection reports from previous years. Continued monitoring and review of instrumentation data is recommended. In the case of a significant variation in the instrumentation data, the designer should be notified according to the OMS manual. A significant variation is defined by a change compared to usual seasonal trends and should be followed-up to monitor the evolution of the event and identify its causes and consequences, as well as the appropriate actions to take.

Figure A1 shows a plan view of East Dike, Figure A2 shows a plan view of South Camp Dike and Bay-Goose Dike, and Figure A3 shows a plan view of Vault Dike. These figures indicate the location of the photos taken and observations noted during the inspection.

3.1 East Dike

East Dike is located on the east side of Portage Pit and isolates the northwestern arm of Second Portage Lake. Dewatering of the northwestern arm of Second Portage Lake allowed for the development of Portage Pit and the construction of the TSF. At the time of the inspection, East Dike served as an access road to the northern portion of Bay-Goose Dike and had not been used as a haul road since 2011.

East Dike is approximately 800 m in length and was constructed within Second Portage Lake prior to dewatering. It consists of a wide rockfill shell, with downstream filters and a soil-bentonite cut-off wall that extends to bedrock up to 8 m below lake level.

3.1.1 Field observations during inspection

At the time of the 2020 inspection, no signs of sloughing or settlement were observed on the structure (including the vicinity of the 2009 sinkhole near Sta. 60+472). The tension crack observed around Sta. 60+480 m in 2018 was no longer visible.

Three seepage zones were identified in the past near the downstream toe of East Dike (at Sta.60+247, 60+498, and 60+575). The zones at about Sta. 60+247 and Sta. 60+498 each have a seepage collection sump with a pump connected to a year-round pumping system. At the time of the inspection, the seepage was being captured within these sumps. According to AEM, the zone at about Sta. 60+575 was practically dry all year, with very little ponding water and no flow observed during the inspection. No sign of new seepage on the ground surface or downstream was observed.

From the visual inspection, the performance of East Dike is satisfactory, as:

- no visual signs of slope instability or erosion were observed on the upstream and downstream rockfill slopes.
- no visual signs of significant cracking or settlement were observed on the dike and along the cut-off wall alignment, besides one tension crack.
- freeboard is adequate.

3.1.2 Geotechnical instrumentation data review

Instrumentation has been installed within East Dike and includes piezometers, thermistors, inclinometers, and flow meters, as detailed in Appendix I (Table 1 and Table 2). The location of the instrumentation is indicated in Appendix C1. The inclinometer at Sta. 60+195 was destroyed in the past and has not been replaced. Replacement of this instrument is not considered necessary; however, monitoring of East Dike should continue and, if anomalous conditions are observed, then replacing this inclinometer should be re-evaluated.

The following subsections present a summary of the data collected between September 2019 and September 2020. Previous annual geotechnical inspection reports contain additional information regarding instrumentation data collected prior to September 2019. The 2020 instrumentation data for East Dike are presented in Appendix C.

3.1.2.1 Piezometers

Three arrays of multilevel vibrating wire piezometers (VWP) are installed within East Dike as follows:

- South Channel (Sta. 60+190)
- North Channel (Sta. 60+490)
- North Shallows (Sta. 60+700)

At each location, multilevel VWPs were installed:

- upstream side of the cut-off wall, approximately 2 m from the centreline
- immediately downstream of the cut-off wall, approximately 2 m from the centreline
- further downstream of the cut-off wall, approximately 10 m from the centreline

Single VWPs were also installed downstream of the cut-off wall near the contact area (base of cut-off wall and top of the bedrock surface). VWP-400-C and VWP-420-C show a seasonal trend that is rising through the years since 2015. For the last three years, the rising seasonal trend doubles each year. There was no visual observation of this pressure increase on the field. This increase is not associated to a rise of temperature but rather the contrary: it is considered that this behaviour is linked to progressive freeze-back of the foundation bedrock. It is recommended to closely follow the significant seasonal trend in the future and react quickly if need be. VWP-500-C and VWP-510-C only exhibited a small increase in 2020, which suggests that this behaviour may start in these instruments as well over the next years and should be monitored

Some of the installed piezometers on East Dike are broken or malfunctioning, most of them due to freezing, as detailed in Appendix I (Table 1). Those instruments give either no data or erratic data. A piezometer that has frozen at some point is unreliable, as freezing generally breaks the piezometer or shifts its calibration curve. It is thus recommended to flag these piezometers and be very careful when interpreting their data.

The piezometers' data show that the pore water pressure is to the value recorded in the past with a long-term trend going towards a slow increase in the pore water pressure, possibly related to freeze-back of the pit walls.

Specific observations have been made for the three piezometric arrays located at Sta. 60+190, Sta. 60+490, and Sta. 60+700, as follows.

Sta. 60+190

At Sta. 60+190, the observed levels are consistent with expectations for a functioning cut-off wall. There is a consistent drop in the hydraulic head across the cut-off wall and within the grouted bedrock in the downstream direction. Further downstream, the hydraulic head continues to decrease. There are spike increases in the hydraulic head in the spring of 2020, similar to the previous years. These spikes are probably due to pumping interruption for maintenance or change of discharge from the lake to the pit. The general trend in the piezometric readings has been steadily increasing since 2014 and the increase is accelerating since 2019 and should be monitored. As with other sections of East Dike, the increasing pressure is associated with progressive freeze-back of the foundation. At Sta. 60+190, the thermal sensors indicate still thawed conditions, however it is probable that the surrounding areas are progressively freezing and concentrating the flow.

As observed in past years, no instrument froze in the winter and the temperature data indicate the presence of seepage. Since temperature fluctuations at 190-P1-C do not show seasonal variations correlated to air temperature in contact with the ground surface, it is highly probable that seepage water from the upstream side of the dike is responsible for the thermal behaviour. The recorded piezometric pressure decreases towards the downstream side and with elevation, which seems to indicate that flow is occurring towards the pit. Given the hydraulic head response consistent with the expectations of a functioning cut-off wall, it is reasonable to assume that the seepage water is originating from a different part of the dike.

Sta. 60+490

At Sta. 60+490, flow through the dike is observed as the piezometric pressure is very similar before and after the cut-off wall (490-P3-B vs 490-P2-B in particular). There are spike increases in the hydraulic head in the spring of 2020, similar to the previous years. These spikes are probably due to pumping interruption for maintenance or change of discharge from the lake to the pit. Signs of seepage are also observed in the thermal instrumentation data associated with this piezometric array. The general trend in the piezometric readings has been steadily increasing since 2014 and the increase seemed to accelerate in 2019. In 2020, the fluctuations are similar to

those observed in 2019 and should continue to be monitored. At Sta. 60+190, the thermal sensors indicate still thawed conditions, however it is probable that the surrounding areas are progressively freezing, as indicated by thermal variations in piezometer 60+500-C, and concentrating the flow.

None of the instruments are frozen; there is a correlation between the lake temperature and the temperature recorded by the piezometric array at this location, and the temperature data follow the same trend with very little offset. These piezometric and thermal trends correspond to the seepage zone observed at Sta. 60+498. The recorded piezometric pressure decreases towards the downstream side and with elevation, which seems to indicate that flow is occurring towards the pit.

Sta. 60+700

At Sta. 60+700, piezometers at the P1 and P2 lines (downstream of the dike and close to the centreline) are now frozen. The instruments still give reasonable data and show that the observed levels are consistent with expectations for a functioning cut-off wall. The general trend in the piezometric readings has been steadily increasing since 2014 and the increase seems to be accelerating since 2019 and should be monitored. Freeze-back of the foundation observed at Sta. 60+700 is likely causing the rise in pressure.

The temperature data are consistent with observations noted during the previous years and indicate mostly frozen conditions.

3.1.2.2 Thermal Regime

Five thermistor strings with 16 nodes at 1 m interval are installed on East Dike, as detailed in Appendix I (Table 1). The instrumentation data for the September 2019 to September 2020 period are consistent with the historical trends, with a slow long-term cooling trend. Specific observations have been made for each instrument for the period analyzed, as follows.

In addition to thermistors, thermal sensors of piezometers installed in the cut-off wall and bedrock along the centreline at 60+550, 60+600 and 60+650 also indicate frozen condition.

Sta. 60+092 and Sta. 60+842

The thermistors installed at Sta. 60+092 and Sta. 60+842 are located on the southern and northern abutments. The upper 1 m of the dike of both abutments thawed in 2020 (active layer). From September 2019 to September 2020, there has been little to no change in the ground thermal regime. Below El. 134 m, the cut-off wall remained frozen for these two thermistors. The temperature within the dike varied from 10°C to -20°C within the active layer of the dike, from -2°C to -12°C in the till, and from -3°C to -10°C in the bedrock. Fewer temperature variations were generally observed with depth at each location.

Sta. 60+185

The thermistor string installed in the South Channel at Sta. 60+185 (bedrock about 6 m below water surface at El. 127 m) recorded the following temperature variations:

- The upper layer of the cap material (from El. 136 m to El. 131 m) was thawed in September 2020 and was frozen during the winter period (active layer). The active layer shows significant fluctuations in temperature, going from 3°C to -12°C.
- The cut-off wall above the lake level and in the till below El. 131 m remained thawed all year with a maximum of 2.5°C. This observation differs from the 2019 inspection report; however, this is likely due to the

new presentation of data by AEM which allows a better identification of the trends. The multi-year data shows very little to no change in the ground thermal regime. This result concurs with potential seepage inferred from the thermal behaviour at 190-P1-C at Sta. 60+190. However, 190-P1-C is further downstream from the dike and the lag between maximum 190-P1-C, and the data seem to suggest that the water is originating from a different part of the dike structure closer to Sta. 60+490.

- The bedrock portion of the dike (below El. 127 m) remained thawed. The bedrock had a temperature variation between -0.5°C and 3°C increasing with depth.

Sta. 60+485

The thermistor string at Sta. 60+485, installed within the North Channel (bedrock at approximately El. 126 m, 7 m below lake level), indicated the following temperature variations:

- The upper portion of the cut-off wall located in the lake (from El. 136 m to El. 132 m) was in an active zone. Significant temperature fluctuations were recorded (12°C to -20°C).
- The cut-off wall below El. 132 m and the bedrock remained thawed during the year with significant variations in temperature (between 12°C and 0.5°C).

The thermal variation observed within the cut-off wall below El. 132 m and in the bedrock is significant, with fluctuations between 12°C and slightly above 0°C. From September 2019 to September 2020, there is good correlation between recorded temperatures and the upstream lake temperatures, indicating advective flow through the dike (i.e., recorded temperature changes are primarily a result of temperature changes in water flowing through this area). The delay between changes in the recorded temperatures within the lake and within the cut-off wall is minimal. The temperature responses recorded in the piezometers at Sta. 60+490 P2 (A, B, C) are also significant, as are the responses recorded within the piezometers at Sta. 60+460, Sta. 60+472, Sta. 60+480 and Sta. 60+500. Temperatures in piezometers at Sta. 60+190-P1-C, Sta. 60+450, Sta. 60+490-C, and Sta. 60+490 P1 (A, B, C) react as well but with a decreasing amplitude over the years. Seepage is being observed downstream and is collected in the sump and removed via the pumping system.

Sta. 60+695

The thermistor string installed in the North Shallow at Sta. 60+695 (bedrock at approximately El. 128.5 m, 4.5 m below upstream lake level) recorded the following temperature variations:

- The thermistor beads from El. 136 m to 134 m indicate that the upper portion of the cut-off wall was thawed in September 2020 and frozen during the winter (active layer). The recorded temperature variations are between 7°C and -18°C.
- The thermistor beads from El. 134 m to 128 m indicate that the cut-off wall and the till between these elevations remained frozen throughout the monitoring period, with temperature fluctuations between 0°C and -9°C.
- The temperature recorded in the bedrock varied between -1°C and 1.5°C increasing with depth.

In addition to thermistor data, piezometers' thermal sensors confirm that there is a general cooling trend. At Sta. 60+700, piezometers (P1 and P2 lines) are now entirely in permafrost.

3.1.2.3 Inclinometers

Two inclinometers are installed on East Dike at Sta. 60+495 and 60+705, as detailed in Appendix I (Table 2). The inclinometer displacements are referenced along Axis A and Axis B; Axis A is perpendicular to the cut-off wall alignment (positive displacements are towards the Pit side), while Axis B is parallel to the cut-off wall (positive displacements are towards the increasing chainage), perpendicular to Axis A.

Recorded displacements are small. The maximum cumulative displacements at the crest were observed in the inclinometer installed at Sta. 60+705. The cumulative displacement is about 47 mm perpendicular to the cut-off wall (Axis A), and -25 mm aligned to the cut-off wall (Axis B). From 2019 to 2020, no significant movements were observed for all inclinometers; they have all been relatively stable since 2014. The recorded displacements are well within the tolerable displacements for the structure and are not a concern.

3.1.2.4 Seismograph

No peak particles velocity measurements (measured by the peak vector sum or PVS) were taken in 2020 for East Dike as no blasts occurred in the vicinity of East Dike.

3.1.2.5 Flow Meters

The flow at the downstream toe between September 2019 and September 2020 was measured by the flow meters installed in the two seepage collection sumps downstream of East Dike. The average flow measured during the year was around 19.1 m^3/h with peak activity averaging approximately 39.7 m^3/h in June 2020. The measured flow is relatively stable compared to values from the past year. Over the 2019-2020 winter, the flow was measured between 13.4 and 25.5 m^3/h and had slightly increased compared to the three previous winters. It is considered that flow during winter is more representative of the seepage, with no incidence of precipitations and snowmelt.

During the year, the water quality in the sump was monitored by the environment department every week during freshet. According to the procedure in place, the water is pumped in Portage Pit instead of being sent to Second Portage Lake when the total suspended solids (TSS) criterion is exceeded. This was the case from June 2020. Over the past years, the TSS was usually acceptable during the winter, until the freshet. At the time of the inspection, the water was still pumped into the pit.

Based on the instrumentation data, the performance of East Dike is satisfactory, as:

- seepage rates, while higher than anticipated in the design, are stable and are controlled by the pumping system in place. The TSS criterion is low enough for the water to be released in Second Portage Lake, except during the freshet and summer of 2020.
- instrumentation data: piezometric, thermal, seepage, and inclinometer data do not show deteriorating conditions.

A photographic log and the record of inspection form for East Dike is provided in Appendix A1.

3.2 South Camp Dike

South Camp Dike is located south of the plant site area and is used to connect the mainland to South Camp Island. South Camp Dike, in conjunction with Bay-Goose Dike, isolates a portion of Third Portage Lake (Bay-Goose Basin) that allowed the development of Goose Island Pit and the southern portion of Portage Pit. It covers a narrow channel, approximately 60 m wide, with shallow water depths ranging from 0.5 m to 1.0 m.

South Camp Dike has a broad rockfill shell with a bituminous geomembrane liner installed on the upstream side. Compacted granular material mixed with bentonite was placed above the toe of the liner. The liner was installed on native frozen (permafrost) till material in a trench approximately 3 m to 5 m below the lakebed surface. At the time of the inspection, South Camp Dike was used as an access road to connect the southern part of Bay-Goose Dike, and the contractor's offices and equipment area with the mine facilities.

3.2.1 Field observations during inspection

An ultramafic waste rock stockpile about 10 m high is located 20 m away from the downstream toe of the dike. The distance between South Camp Dike and the waste rock dump is sufficient to allow a complete visual inspection of the downstream area of the dike. It is recommended to continue keeping the downstream toe of the dike clear to facilitate inspection. The downstream toe and slope area were in good condition.

A very limited amount of water was ponding on the downstream side of South Camp Dike. No flow was observed. This is likely due to run-off water and the pond was smaller than in 2019, when a much wetter season was reported.

No geotechnical issues or seepage were observed during the inspection.

A photographic log and record of inspection form for South Camp Dike is provided in Appendix A2.

3.2.2 Geotechnical instrumentation data review

Two thermistor strings are installed on the upstream side of South Camp Dike. SD-10 is located near the liner toe. SD-09-A is located approximately 20 m further upstream within Third Portage Lake. South Camp Dike thermistor data for September 2018 to September 2019 are presented in Appendix C. Based on the thermistors data, no signs of seepage are evident, and the recorded value follows historical trends.

The following summarizes the observations regarding the thermal regime at these locations:

- The temperature profile at SD-09-A on the upstream side of the dike shows that the soils located beneath the dike foundation and liner have remained frozen (permafrost) below El. 127 m. An active layer is present between El. 133 m and 127 m. The summer warm-up is more pronounced in 2019 and 2020 compared to the previous years. It may be linked to a change in the instrument setup after 2019. Nodes around El. 130 m and 124 m indicate a temperature decrease since 2014.
- The temperature profile at SD-10 shows that the foundation of the dike below the thermal cap stayed frozen all year long.

3.3 Bay-Goose Dike

Bay-Goose Dike is located within Third Portage Lake on the southern side of Portage Pit and encompasses the Goose Island Pit. Bay-Goose Dike, in conjunction with South Camp Dike, isolates a portion of Third Portage Lake (Bay-Goose Basin).

Bay-Goose Dike is approximately 2,200 m long and consists of a wide rockfill shell, with downstream filters and a cut-off wall. For the majority of the dike, the cut-off wall extends to bedrock and consists of soil-bentonite (SB) and/or cement-soil bentonite (CSB). For portions of the dike where the cut-off wall was not constructed to bedrock, jet grouting of the soil between the base of the cut-off wall and the bedrock was performed, thereby

extending the low permeability element of the dike to the bedrock surface. The water depth beneath the dike is up to 9 m, with a maximum depth to bedrock below lake elevation upwards of 20 m.

Instruments to monitor and assess the dike's performance are installed on Bay-Goose Dike. The instrumentation includes piezometers, flow meters (water collection pipe and a plastic bucket), thermistor strings, and inclinometers. Every blast in the vicinity of the dike was monitored for blast vibration during mining of the Meadowbank pits, but this monitoring has now been terminated since no more blasting activity is taking place there. Appendix C1 shows the location of the instrumentation on Bay-Goose Dike.

3.3.1 Field observations during inspection

The tension cracks observed in 2013 and 2014 on the upstream side within the thermal cap (between approximately Sta. 32+100 and 31+750) were still visible during the 2020 inspection but did not show signs of progression and were not active anymore. Settlement within the thermal cap and on the upstream side of the crest (from approximately Sta. 32+100 to 31+950), ranging from 0.1 m to >1.0 m, was observed but did not show any significant sign of movement since previous years. These areas should continue to be closely monitored to make sure no aggravating conditions are developing.

Seepage channels and water accumulation were observed at the toe of the dike during the inspection (North Channel, Central Channel, Central Shallows and Channel 3). There is currently no downstream seepage collection system at the downstream toe of the dike as the amount of seepage reporting downstream is currently too small to require such a system. Part of the seepage seems to be reported to the pit. Flow from these channels is monitored by various stations. At the time of the inspections, stations 6, 7, 8 and 9 were active and no turbidity was observed in the water at the downstream toe. Refer to Section 3.3.2.5 for flowmeter measurements.

Water was observed flowing in the North Channel during the inspection at Sta. 30+420 m. The flow was low and decreased since 2016. According to AEM, water was observed ponding at the toe during the year. Due to the topography, it is possible that water is ponding in this area from a nearby seepage channel (i.e., near the northern abutment). The piezometers of the North Channel have shown response to the unloading conditions that is part of the push back for extension of Pit E3 and Pit E4 (see Section 3.3.2.1 for more details). The North Channel is closely monitored when blasting is done to ensure that blast vibrations from Pit E do not exceed the design limit of 50 mm/s, but no more blasting is being conducted in the area. It is recommended to regularly inspect this area, monitor the flow of water, and be on the lookout for signs of seepage from the toe of the dike and in Pit E4.

Water flow was observed into the Central Shallow seepage channel during the inspection at Sta. 30+625 and 30+655. The flow was low and within the expected trend.

A water pond formed by the Central Channel seepage was observed downstream at Sta. 31+125. The mine pumps this pond several times in the summer, and piezometers show a response to the pumping. The inflow has not been monitored in this area since 2015. It is recommended to keep measuring the water inflow when pumping the water pond formed at Central Channel.

Water flow was observed at Channel 3 during the inspection at about Sta. 31+500 m. The flow was low although it increased in 2019 compared to previous years. A drainage channel is dug into the ring road nearby to allow water to flow freely into the pit. According to AEM, water has been reported to the pit from this location during the year through a drainage ditch.

A water pond was observed downstream at Sta. 31+750, between Channel 2 and Channel 1. This water pond is not considered seepage as its level never changes except at freshet and after rain events. It is recommended to visually inspect the pond periodically and, if the level changes, to monitor water flow.

Channels 1 and 2 were not active at the time of the inspection. An accumulation of water was observed further downstream against Goose Pit ring road. According to AEM, water is observed downstream in that area during freshet season and naturally drains to Goose Pit without reaching the dike toe. The instrumentation near Sta. 32+000 (Channel 1) indicates a potential seepage zone in that area. It is probable that seepage occurs at this location but reports directly to the pit. The instrumentation at this location needs to be closely monitored for changing trends.

During the inspection, it was observed that an inflow of water was still reported to Goose Pit and that some of the pit walls were wet. These observed water inflows were near Channels 1, 2, and 3 and are not being monitored because the pit is not accessible anymore.

From the visual inspection, the performance of Bay-Goose Dike is satisfactory, as:

- no visual signs of slope instability or erosion were observed on the upstream and downstream rockfill slopes.
- the settlement and sloughing observed in the thermal cap and in the upstream side of the crest are stable and are no longer active.
- freeboard is adequate.

A photographic log and the record of inspection is provided in Appendix A2.

3.3.2 Geotechnical instrumentation data review

Instruments were installed on Bay-Goose Dike to monitor the dike's performance following construction, during dewatering and operation, and into closure. They include piezometers, thermistors and inclinometers (standard type and TDR cable). At the time of the inspection, all the piezometers and thermistors on Bay-Goose Dike had an automatic data collection and transmission system to the VDV database. The following subsections present a summary of the data collected between September 2019 and September 2020. Data plots for the instrumentation sent by AEM are presented in Appendix C.

It must be noted that the current instrumentation of Bay-Goose Dike was designed for performance monitoring from dewatering to closure based on the expected operation duration of about 10 years. The in-pit tailings deposition implies that the dike will be in operation for another decade. As a result, some verifications should be made to ensure that the surveillance and monitoring measures are appropriate. Of particular interest are the sections where SB and CSB portions of the cut-off wall are in contact. Due to the different mechanical properties of these materials, settling of the dike could cause degradation of the CSB wall over time. It was thus recommended to verify whether the current instruments layout and spacing allows for proper monitoring of these contact areas and detection of any degradation that could lead to seepage through the dike. In 2020, a review of the available instrumentation and its spatial distribution shows that coverage is still adequate.Routine monitoring of the instruments should continue and focus particularly on areas with SB/CSB contact, areas with seepage and areas where instruments exhibit a trend that is different from previous observations or unexpected variations.

3.3.2.1 Piezometers

Arrays of multilevel VWPs were installed within Bay-Goose Dike as detailed in Appendix I (Table 4).

At each location, multilevel VWPs were installed:

- Upstream side of the cut-off wall, approximately 2 m from the centreline.
- Immediately downstream of the cut-off wall, approximately 2 m from the centreline.
- Further downstream of the cut-off wall, approximately 10 m from the centreline.

In addition, single VWPs were installed immediately downstream of the cut-off wall near the contact area (base of cut-off wall and top of bedrock surface) at several stations.

Some of the installed piezometers on Bay-Goose Dike are broken or malfunctioning, probably from freezing, as detailed in Appendix I. Those instruments give either no data or erratic data. A piezometer that has frozen at some point is unreliable, as freezing generally breaks the piezometer or shifts its calibration curve. It is thus recommended to flag these piezometers and be very careful when interpreting their data while staying vigilant about any rapid piezometric variance. The first time a piezometric rapid increase associated to a frozen piezometer is observed, it is important to remain vigilant without overweighting the abnormal trend. For the instruments showing very high piezometric readings, it is recommended to compare the pressure recorded to the instrument limit, in order to identify if the variance could be due to factors other than mechanical problems such as seepage.

From 2012 to 2020, a generalized trend can be observed in the pore water pressure measurements of most non-frozen piezometers located along the dike (upstream and downstream side). An increase in pore water pressure is observed during winter (approximately November to May). The pore water pressure tends to stabilize or decrease during freshet (approximately May to September). Historically, the rising trend has been attributed to ice build-up at the downstream toe of the dike and the decrease has been attributed to melting of this ice.

A cooling trend starting in July 2012 can be observed in all piezometers installed on Bay-Goose Dike. The instruments located farther on the downstream side generally record lower temperatures than the instrument closer to the dike and the lake. As a result, the instruments on the upstream side of the dike are generally the last ones to freeze and the ones farthest on the downstream side are the first to freeze. In some sectors, most of the piezometers are in frozen condition, while in some sectors almost none of the piezometers are in frozen condition. There seems to be a correlation between the sector in which seepage has been observed historically and the number of frozen instruments. In sectors where freeze-back is occurring, pressures are generally on a slow and steady rise.

There is generally a drop in the hydraulic head across the cut-off wall and within the grouted bedrock in the downstream direction. In general, the data from the piezometers are similar to the historical trend.

In addition to the seasonal trend described above, specific observation trends can be observed for various areas of the dikes. These areas generally coincide with seepage channels as the majority of piezometers are frozen in non-seepage channel areas.

The OMS manual provides procedures in the event of significant or rapid pore-water pressure raises or decreases which need to be followed. The designer needs to be advised in the event of unusual variations.

North Portion (Sta. 30+158 to 30+516.5)

The piezometric level has been stable since 2015 with cyclical variation but has not recovered to the level before 2015. The unfrozen piezometers on the downstream side near the cut-off wall had an approximately 0.5 m

cyclical fluctuation from September 2019 to September 2020. Similar to 2019, a 0.5 m increase in pore water pressure is observed for instruments on the downstream side from the beginning of summer 2020 and had not dissipated at the time of the inspection. Large-scale seasonal variations are seen in the pore water pressure recorded in all piezometers, with fluctuation more pronounced on the downstream side.

These variations in pore water pressure are happening in the zone associated with the North Channel seepage and monitored by seepage stations no. 8 and no. 9. In the past, the pressure typically increased in magnitude of the pore water pressure until freshet and then suddenly decreased as a result of mining activity and the depressurisation of the rock walls in Pit E5. However, with the pit walls freezing back, pressure is progressively prevented from dissipating by drainage trough the wall face. Thermal data from instruments in the pit wall were not available for review.

The temperature recorded by the piezometers is stable with a general cooling trend.

Central Shallows (Sta. 30+645.5 to 30+804)

The majority of the piezometers installed in this area are frozen and give erratic data. Seepage station no. 7, which was active during the summer of 2020, is near this area.

The unfrozen piezometers indicate stable pore water pressures in 2020 with a slight increase (0.5 m) during the summer of 2020.

Central Channel (Sta. 31+020 to 31+220)

There is a seepage zone with ponding water observed downstream associated with this channel. The majority of the piezometers in this area are not frozen.

From 2012 to 2020, the maximum and minimum recorded pore water pressures for the piezometers downstream have been following the usual trend with a slight increase in the past two years. There is generally a pressure build-up from January to June followed by several pressure drops and increases from June to September or October. In 2019, a minimum value around 133.5 m was recorded during freshet and a maximum value around 133.7 m was recorded during winter, indicating that the amplitude of the pressure release at freshet is decreasing, which is associated with the progressive freeze-back of the foundation bedrock see in the thermal sensor of the VWP at Sta. 31+165.

The pore water pressure data tend to fluctuate more during freshet than during winter. This behaviour seems to be consistent with the explanation that the recorded pore water pressures are influenced by the pumping of the water pond located downstream.

Channel 3 (Sta. 31+565 to 31+700)

There is a seepage zone monitored by station no. 6 associated with this channel. There is a drainage channel dug into the ring road in the area to allow water to flow freely in the pit. The piezometric array in this area is mostly frozen and a cooling trend can be observed in the recorded temperature since 2011.

From 2018 to 2020, the pore water pressure has been slowly and steadily increasing, with a decrease in the seasonal variation amplitudes. All piezometers show that pressure minimum has slightly increased over since 2018 (0.5 m per year). The minimum pressure reached during the period from September 2019 to September 2020 was 132.2 m.

Piezometers at Sta. 31+600 located downstream and upstream now read the same values. This could indicate a rise in the downstream pressure due to freeze-back of the surrounding area, as normal seepage rates measured in 2020 exclude an increase in the seepage at this location.

Channels 1 and 2 (Sta. 31+815 to 32+105)

No seepage has been observed at the toe of the dike in 2020, but there is a water pond in this location that naturally drains to Goose Pit through a constructed drainage channel. Most of the piezometers are not frozen in this area.

The recorded pore water pressure in the piezometers located in Channels 1 and 2 has generally been stable (0.2 to 0.5 m fluctuation from winter to freshet) since last year for the piezometric arrays of Channels 1 and 2. The rapid pressure rise trend observed in 2018 in this area has not been observed in 2020 in any instrument of this area. All piezometers are on a steady increase since 2018, with pressure rising by 0.5 m to 1 m in 2020.

The thermal data at Sta. 31+815 might indicate some sign of seepage as the thermal cooling is less pronounced and there is a wider fluctuation of temperature recorded at this location than in the other thermistors nearby.

3.3.2.2 Thermal regime

Thirty-three thermistors (from T1 to T30 and T3’ to T5’) have been installed on Bay-Goose Dike. From September 2019 to September 2020, the following observations have been made.

In addition to thermistors, thermal sensors of piezometers installed show a general cooling trend and freeze-back of instruments over the years.

Sta. 30+134 (T1), Sta. 30+827 (T14) and 32+140 (T30)

The three thermistors installed at Sta. 30+134 (T1), Sta. 30+827 (T14), and Sta. 32+140 (T30) are located on the northern abutment, Goose Island, and the western abutments. The first node of these thermistors is installed about 1 m below the dike crest. For this period, the dike and its foundation were entirely frozen on the northern abutment (T1), the Goose Island abutment (T14), and the western abutment (T30).

Piezometers at 30+158 confirm this trend with all three lines (P1, P2, P3) frozen all year long.

Sta. 30+185 (T2), Sta. 30+489.5 (T9), Sta. 30+553.25 (T10), Sta. 30+621.5 (T11), Sta. 30+650 (T12), Sta. 30+713 (T13), Sta. 31+080 (T15), Sta. 31+134.5 (T16), Sta. 31+170 (T17), Sta. 31+352 (T18), Sta. 31+752.5 (T21), Sta. 31+820 (T22)

Twelve thermistors were installed in the SB portion of the cut-off wall. All the thermistors except for T18 show a similar trend:

- The rockfill is frozen all year below El. 134 m, with the exception of one node in T2 (El. 129 m) and T9 (El. 131 m).
- There is generally an active layer in the till and the upper bedrock, while the deeper bedrock is thawed all year.
- All thermistors except T22 show that the frozen front is progressing deeper every year.

T18 (31+352) indicates that the till and the bedrock remained frozen.

Piezometers at 30+645.5, located between T11 and T12, show that P1 and P2 lines are entirely frozen, while P3 line is still unfrozen but progressively coming close to 0°C.

Piezometers at 31+165, located between T17 and T18, show that the P1 line is in permafrost and that the P2 line is only frozen in the till while the bedrock cools down but remains unfrozen.

Piezometers at 31+815, located between T21 and T22, show that the upper three sensors in the P1 line are in now in permafrost while the deeper bedrock and the P2 and P3 line remain unfrozen.

Sta. 30+260 (T3), Sta. 30+261.5 (T3'), Sta. 30+272 (T4), Sta. 30+273.5 (T4'), Sta. 30+288.5 (T5), Sta. 30+290 (T5'), Sta. 30+330.5 (T6), Sta. 30+261.5 (T3'), Sta. 30+273.5 (T4')

This portion of the dike contains a cut-off wall where settlement could occur due to CSB, a rigid material, sitting on top of SB, a soft material. The thermistor nodes configuration for T3 (Sta. 30+260), T4 (Sta. 30+272), and T5 (Sta. 30+288.5) has nodes located very close together to monitor the interface between the CSB and SB materials as noted below. Thermistors T3, T4, and T5 were not installed to the designed depths, but instead have been installed below the interface and monitor the bedrock contact. These thermistors are recording temperatures above 0°C. T3' (30+261.5), T4' (Sta. 30+273.5), and T5' (Sta. 30+290) provide readings across the CSB/SB interface.

Thermistor T6 indicates that the ground is completely unfrozen below El. 130 m. Therefore, the till foundation was unfrozen from September 2019 to September 2020. From El. 130 to 132 m, the ground fluctuates above and below 0°C and from El. 132 to 135 m, and the dike remained frozen.

No seepage directly downstream of this portion of the dike was observed; however, based on the topography, it is anticipated that seepage from this area could report to a lower point within the North Channel (i.e., 30+360). These thermistors show that the till and bedrock were almost completely unfrozen from September 2019 to September 2020.

Piezometers at 30+276.5, located in bedrock between T4' and T5, show that the P1 line is in permafrost and that P2 line is freezing back with the upper 2 sensors frozen all year long, while P3 line remains unfrozen.

Sta. 30+386 (T7), Sta. 30+417.5 (T8), Sta. 31+595 (T19), Sta. 31+605 (T20), Sta. 31+850 (T23), Sta. 31+880 (T24), Sta. 31+960 (T25), Sta. 31+995 (T26), Sta. 32+030 (T27), Sta. 32+060 (T28), Sta. 32+100 (T29)

Eleven thermistors were installed in areas where the bottom of the cut-off wall was jet grouted. These thermistors show that the maximum active layer depth was above 135 m between September 2019 and September 2020. The majority of the rockfill stayed frozen all year and the till and bedrock were unfrozen all year with an exception at T20 and T29.

At T20 and T29, a part of the till foundation outside of the jet grouted area (between El. 122 m and 126 m at T20, and between El. 127 m and 133 m at T29) remained frozen for the entire September 2019 to September 2020 period. The jet grouted area, however, did not remain frozen. The temperature of the jet grouted area varied between 0°C and 1°C.

Piezometer 31+600, located between T19 and T20, shows that P1 and P2 lines are freezing from the surface. The deeper instruments and the P3 line remain unfrozen. Similarly, piezometers at 32+105, located near T29,

show that the P1 line is in permafrost and that P2 line is freezing back with the upper two sensors frozen all year long, while P3 line remains unfrozen.

Piezometers at 32+000, located between T26 and T27, show that the upper two sensors (in till) in the P1 line are in permafrost while the bedrock and the P2 and P3 line remain unfrozen.

Piezometers thermal sensors in seepage channels

North Channel (Sta. 30+158 to 30+516.5)

Piezometers at 30+453.5 are still unfrozen, except for the upper sensor in the P1 line which is now frozen. Piezometers at 30+378.5 are unfrozen all year, except for the upper sensor in the P1 line starting to freeze.

Channel 1 and 2 (Sta. 31+815 to 32+105)

Piezometers at 31+885 are unfrozen all year. Similarly, piezometers at 32+065 remain unfrozen, however the upper sensor in the P2 line (in till) is now frozen.

3.3.2.3 Inclinometers

Eight standard inclinometers are installed on Bay-Goose Dike, as detailed in Appendix I (Table 5 and Table 6). O The inclinometer displacements are referenced along Axis A and Axis B. Axis A is perpendicular to the cut-off wall alignment (positive displacement towards the Pit side) while Axis B is perpendicular to Axis A, parallel to the cut-off wall (positive displacements towards the increasing stationing). Cumulative displacement in Axis A varied from 0.1 mm to 12.5 mm. Cumulative displacement values for Axis B varied from 0.1 mm to about 9 mm. The larger settlement happened in the upper portion of the dike and in the thermal cap. Recorded displacements are mainly small and are within the tolerable displacements for the structure.

In the summer of 2020, a slight lateral movement towards the upstream side (up to 5 mm) was measured in the cut-off wall (mostly between El. 129 m to 131 m) in inclinometers, 30+282, 31+180, 31+815 and 31+885. There is no sign of movement visually on the field. No other significant movement was observed for other inclinometers from September 2019 to September 2020, whose measurements have remained relatively stable since 2014. Offsets in the measurement were previously linked to the replacement of the reel.

3.3.2.4 Seismograph

Seismograph monitoring of blast vibrations on the crest of Bay-Goose Dike has been done for every blast at Goose-Pit and Pit E4/E5. AEM analysed the monitored blast vibrations after each event. The maximum allowable PVS for all dikes is set at 50 mm/s per the designer's recommendations. No blast was done in the reported period since mining activities were terminated at the Meadowbank site.

3.3.2.5 Flow Meters

From September 2019 to September 2020, the total average flow of all active monitored seepage station no. 6, 7 8 and 9 due to seepage from the toe of the dike was measured at 10.5 m^3/day compared to 38.2 m^3/day in 2019, 10.7 m^3/day in 2018, 14.7 m^3/day in 2017, 24 m^3/day in 2016, 29 m^3/day in 2015, 132.2 m^3/day (1.5 L/s) in 2013, and 97.2 m^3/day (1.22 L/s) in 2012. The measured flow does not take into account the inflow of water from the pond at Central Channel, as this value has not been measured since 2015 (61 m^3/day in 2013 and 2014). Overall seepage is relatively stable and less than anticipated and is thus currently not a concern.

The North Channel is being monitored by stations 8 (30+420) and 9 (30+380) and had no measurable flow in 2020, compared to 5.8 m^3/day in 2019, 0.7 m^3/day in 2018, 4.9 m^3/day in 2017, 1.9 m^3/day in 2016, 17 m^3/day in 2015, 58 m^3/day in 2013 and 80.8 m^3/day in 2012. It is the first time that no seepage is observed at this seepage station.

The Central Shallow seepage channel is being monitored by station 7 and had an average flow of 6.9 m^3/day compared to 15 m^3/day in 2019, 4.5 m^3/day in 2018, 5.6 m^3/day in 2017, 11.5 m^3/day in 2016, 12 m^3/day in 2015, 13.3 m^3/day in 2013 and 18.9 m^3/day in 2012. This is similar to historic trends.

Channel 3 is monitored by station 6, which recorded an average of 8.2 m^3/day compared to 17.4 m^3/day in 2019, 2.6 m^3/day in 2018, 4.2 m^3/day in 2017 and 9.3 m^3/day in 2016. This is similar to historic trends.

Flows observed in 2020 appear lower than in 2019 and closer to the usual trends from previous years. This confirms last year's hypothesis that the unusually high seepage rates were caused by exceptional precipitations at the site reporting to the seepage channels monitoring stations during the spring and summer of 2019. This is partly due to the seepage stations being installed not directly at the toe of the dike, allowing runoff water to collect upstream of the stations and influencing the measurements. It is recommended to continue monitoring the evolution of the seepage at the toe of the dike and to continue measuring the inflow of water from the pond at Central Channel.

Based on the instrumentation data, the performance of Bay-Goose Dike is satisfactory, as piezometric, thermal, seepage, and inclinometer data do not show concerning deteriorating conditions, although the situation at the North Channel and Channels 1 and 2 must be monitored.

3.4 Vault Dike

Vault Dike is located across a shallow creek that connects Wally Lake and Vault Lake, at the Vault Pit area. Vault Dike was designed and constructed as a zoned rockfill dam with filter zones and an impervious upstream liner consisting of a bituminous membrane. The dike has an upstream key trench made of aggregate mixed with bentonite.

3.4.1 Field observations during inspection

No geotechnical concerns were identified, and Vault Dike was in good condition.

A photographic log and record of inspection form for Vault Dike is provided in Appendix A3.

3.4.2 Geotechnical instrumentation data review

Four thermistor strings were installed on Vault Dike and four are operational, as detailed in Appendix I (Table 7). The Vault Dike thermistor data are presented in Appendix C. The instrumentation is indicating that the foundation of the dike is mostly frozen all year long and that the structure is behaving as expected with data following historical trends. Given that the remaining instruments indicate a frozen state as expected, it is considered unnecessary to replace the broken instrument.

The following thermal regime observation were made:

- The instrumentation shows that the entire foundation of Vault Dike (till and bedrock) is frozen.
- The upstream toe liner tie-in remained entirely frozen all year long.
- The active layer in the rockfill was up to 6 m thick in the summer of 2020.

4.0 WHALE TAIL PROJECT DEWATERING AND WATER MANAGEMENT DIKES

The dewatering and water management dikes at the Whale Tail Project site include: Whale Tail Dike, WRSF (Waste Rock Storage Facility) Dike, North East Dike, and Mammoth Dike. Whale Tail Dike has been in operation since the dewatering of Whale Tail North pond in March 2019. The commissioning of WRSF Dike, North-East Dike and Mammoth Dike began with freshet 2019 onset when water reached the toe of the structures.

The most current version of the OMS manual (AEM 2019a) is dated March 2019 for the Whale Tail Project dewatering dikes. The most current version of the overall Emergency Response Plan for the mine (AEM 2018) is dated January 2018. It is good practice to review these documents each year to keep the information up to date, particularly the 24-hour contact name and phone number.

A detailed visual inspection of the dewatering dikes is performed by AEM once a month, with more frequent routine inspections conducted as required by the OMS depending on the TARP level. The monthly inspection reports were reviewed as part of the annual inspection. All instruments on Whale Tail Dike, WRSF Dike and Mammoth Dike are connected to a system that automatically collects and transmits data every three hours. Data for all instruments can be visualized on the software (VDV). A review of the instrumentation data for the Whale Tail Project dewatering dikes is presented in the following sections. During the year, regular review of the instrumentation on the dewatering dikes is done by mine personnel and quarterly reports summarizing their observations are issued internally. Reports for structures with a yellow Trigger Action Response Plan level are issued on a monthly basis. The compilation of the instrumentation data was not part of the scope of this study, and the figures showing the data were provided by AEM. The information provided by AEM is presented as received in Appendix C. The data were sent as figures for the dewatering dikes and as PowerPoint and Excel files for the TSF structures. The information provided by AEM is presented as received in Appendix C. The data were sent as figures for the dewatering dikes and as PowerPoint and Excel files for the TSF structures. This revised presentation is clearer than the previous one and allowed for a better interpretation of the instrumentation data. As a result, some interpretations including data trends and depth of active layers are slightly different from those in the inspection reports from previous years. Continued monitoring and review of instrumentation data is recommended. In the case of a significant variation in the instrumentation data, the designer should be notified according to the OMS manual. A significant variation is defined by a change compared to usual seasonal trends and should be followed-up on to monitor the evolution of the event and identify its causes and consequences, as well as the appropriate actions to take.

Figure C3 shows a plan view of Whale Tail Dike, Figure C1 shows a plan view of WRSF Dike, Figure C2 shows a plan view of North-East Dike, and Figure C4 shows a plan view of Mammoth Dike. These figures indicate the location of the photos taken and observations noted during the inspection.

4.1 Whale Tail Dike

Whale Tail Dike (WTD) is a structure to isolate the Whale Tail Pit from Whale Tail Lake. WTD is located on a shallow plateau of the lake floor with an approximate 2 m depth of water. This plateau is located between deeper sections of the lake with water depths of about 12 m. WTD is a zoned rockfill dike with a core composed of a dynamically compacted fine filter. The low permeability element of this structure is a cement-bentonite (CB) cut-off wall consisting of secant piles drilled through the densified fine filter core. The elevation of the cut-off wall is 157 m, and it is covered by a 2 m thick rockfill thermal cover with a crest at elevation 159 m. The bedrock

foundation was curtain grouted to a depth of 10 m along the western section of the dike in 2018-2019. The foundation along the eastern section of the dike was not curtain grouted as it was frozen at the time of construction. The dike has an average height of 9 m and a 13 m wide crest. Upstream and downstream rockfill platforms with a crest elevation of 154 m are present, although the upstream platform is submerged by water.

The downstream side of the dike was dewatered between March and September 2019 and the Whale Tail South (WTS) Lake level upstream side of the dike is limited by discharge through the South Whale Tail Channel (SWTC). An important seepage was observed at the toe of the dike from the summer of 2019. The surface seepage is collected in a trench from Sta. 0+720 to 0+430 and monitored by two V-notch weirs installed in the trench at Sta. 0+430 and 0+520. 35 visible streams from the downstream toe are identified with survey sticks at the crest of the trench. Another 20 are identified right at the toe of the dike and were painted with a pink letter. Two other streams in the two bays downstream of 0+430 are observed as well. A sandboil area was reported by AEM at 0+365 as well as an additional visible flow area at 0+277. Based on WTS water levels measurements as of summer 2019, it is likely that about 200 to 250 m^3 of the seepage was not visible. Flowrates at the V-notch located at the end of the seepage collection trench (Sta. 0+430) were in the order of 300 m^3/h during the open water season of 2019.

In order to mitigate the seepage, a grouting remediation campaign was conducted from November 2019 to March 2020 to inject a grout blanket at the interface between the fractured bedrock and the secant piles, directly downstream of the cut-off wall between Sta. 0+750 and 0+176. The effectiveness of this campaign seems to be confirmed by instrument data and observed seepage flow rates (see Section 4.1.2).

A seepage interception system composed of a series of four (4) pumping stations (P1 to P4) was installed over the winter of 2020 at the downstream toe of WTD, on the downstream side of the seepage collection trench. Refer to Section 11.5 for the description of this system.

4.1.1 Field observations during inspection

No geotechnical concern was observed with WTD during the inspection. Some cement was present on the crest surface of the dike from grouting operations. The rolling surface shows rutting. The dike is currently closed to all traffic. Some water was ponding on the downstream platform during the inspection. It is recommended to profile the downstream platform surface to promote drainage toward the downstream slope.

At the time of the inspection in July 2020, the seepage rate measured in the seepage collection trench vas 90 m^3/h. Streams reporting to the trench appeared smaller than in 2019, however parts of the dike foundation that were unfrozen in 2019 were still frozen and seepage may still increase over the next months. The seepage water was clear but pumped by means of the seepage interception system to the attenuation pond for treatment due to a high pH (around 9-10). According to AEM, the water quality has been relatively constant since the fall of 2019.

The discharge of water from the water treatment plan in WTS was located upstream of the dike at approximately Sta. 0+700.

4.1.2 Geotechnical instrumentation data review

Piezometers, thermistors, as well as a temporary crackmeter and a seepage monitoring station are installed on WTD (see Appendix I for details). Many of these instruments have shown evidence of seepage through the bedrock since their installation. Data have been reviewed since the instruments' installation, as this is the first data review for Whale Tail Project that forms part of this inspection report.

4.1.2.1 Piezometers

In general, the series of P1 and P2 piezometers (downstream of the cut-off wall) react downstream pond and seepage collection stations pumping, suggesting a connection through the bedrock. P3 instruments (upstream of the cut-off wall) show higher pressures than the downstream side. At Sta. 0+260, the P1 line, further downstream, indicates higher pressure than the P2 line, closer to the wall. At Sta. 0+360, this is only the case near the surface of the foundation (piezometers C). This trend is not observed at Sta. 0+440, where P1 pressures are lower than P2 pressures. In general, gradients are consistent with observed seepage areas and directions. An upstream to downstream and downward vertical gradient is observed across the wall (P2-P3 lines). Lower pressure at Sta. 0+360 in the P2 line compared to the corresponding piezometers at 0+260 and 0+440 suggests a lateral gradient towards this location, consistently with the potential seepage flowpath identified by the geophysical survey.

The piezometers have mostly stabilized around the beginning of August 2019 after dewatering of the downstream side and are on a general slow decreasing trend. The series of P3 piezometer generally show a link to the downstream pond level at depth (piezometers A and B) and to the lake water level within the embankment (piezometers C). The exception to this trend is PZ 0+440 P3, where all piezometers follow the lake water level trend.

In addition to the general trends, the following observations were made:

- Piezometers showed spikes in pressure during the grouting campaign due to nearby drilling and injection activities. These spikes usually disappeared rapidly.
- Occasional blockage of the downstream seepage flow (e.g. because of the construction of the seepage collection stations) generally causes a spike in nearby piezometers (at least the P1 and P2 series). The pressure increase dissipates once the blockage is removed and the water is allowed again to flow towards the attenuation pond. This shows a rapid reactivity of water pressure within the bedrock to variations of the downstream pond levels.
- PZ 0+260 P1B had a pressure increase (+0.4 m) over March and April 2020 before decreasing back to normal.
- PZ 0+260 P1C shows a rapid increase in pressure (+0.7 m) at the end of August 2020 which had not completely dissipated in October 2020. None of the piezometers at 0+260 is frozen and thus this increase cannot be attributed to freezing.
- PZ 0+360 P1C has been flagged as unreliable due to unrealistic data trends showing an excessively high increase in pressure. However, this instrument seems to be coming back to the average values measured in the other piezometers of this section and should continue to be monitored.
- PZ 0+360 P3C exceeded lake water level around mid-April 2019 and continued increasing until the end of July 2019. The measurements have since stabilized and the water head now overlaps with the lake level, although with some fluctuations. The pressure increase observed in other P3C piezometers in June 2020 does not show in this instrument, but rather a later progressive increase between July and September 2020 that dissipated in October 2020.
- PZ 0+440: P1B and P2C have been on a slow rising trend since the end of July 2019. This local trend may indicate an uncertain mechanism potentially including flow across the cut-off wall but this is not backed up by thermal data.

Some piezometers have been flagged as frozen over the last few months (PZ 0+260 P1C, PZ 0+360 P2A, PZ 0+440 P2C and P3C). At this date, all these instruments have thawed and readings appear normal, not suggesting any apparent damage to the sensors. Their data must be interpreted with caution.

4.1.2.2 Thermistors

Eight (8) thermistor strings have beads showing capacitive effect. Sixteen (16) beads out of two hundred one (201) are showing capacitive effect due to water infiltration within the cable. Other than those, here are the relevant observations:

- West abutment (0+142): in permafrost condition until August 2020 when the bedrock thawed entirely and rapidly, reaching the lake temperature (13°C), suggesting seepage is now going through the upper bedrock in this area. This section of the bedrock was not injected during the grouting campaign is it was still frozen.
- 0+210, 0+260, 0+310, 0+453: initial cooling in bedrock during dewatering, followed by a rapid warm-up in August 2019 in the upper bedrock, suggesting lake connection through fractured upper bedrock in this zone. The same trend is observed in summer 2020.
- Upstream thermistor at 0+260: the deep bedrock has been thawed since the installation of the instrument but seems to be starting to freeze after July 2020. This could be a result of the bedrock grouting operations.
- 0+360, 0+407: strong reactivity in the cut-off wall and at the bedrock interface. Temporary thermistors in place between August and October in this area (0+475, 0+500, 0+530, 0+580) confirmed that the upper bedrock was strongly reactive to lake temperature variations. The deep bedrock has been thawed since the installation of the instruments but seems to be starting to freeze below El. 135 m (since February 2020 at 0+407 and since June 2020 at 0+360). This could be a result of the bedrock grouting operations.
- 0+520: rapid warmup in July 2019 within the originally frozen bedrock, indicating a strong lake connection since then and reactivity to water temperature variations. The same warming trend is observed in summer 2020. A potential explanation is that water may flow along the grout curtain stopping at 0+516 and seeping through the bedrock (potential seepage location). The deep bedrock seems to be starting to freeze again below El. 130 m after April 2020. This could be a result of the bedrock grouting operations.
- 0+607, 0+675: temperature variations are mainly located within the wall and at the interface, suggesting less connectivity of the bedrock to the lake at this location. This might suggest a potential defect within the wall and a seepage location within the heavily fragmented bedrock. Permafrost condition observed in deep foundation (below El. 132 m) at 0+607. Temporary thermistors installed at 0+635 and 0+665 in place between August and October showed the same trend.
- Temporary thermistors in place between August and October at 0+685 and 0+695: The bedrock was thawed and showed reactivity to the lake temperature variations in its upper 3 m.
- Temporary thermistors in place between August and October at 0+707.5, 0+720 and 0+740: the bedrock was thawed and showed reactivity to the lake temperature variations. The most variations happened within the wall below water level (El. 147 to 152 m).
- 0+772: most of the bedrock is in a permafrost state. Until April 2020, the bedrock above El. 148 m showed a small reactivity to lake temperature variations, while the base of the wall from El. 151 m to 153 m exhibited a

stronger connection to the lake, similarly to nearby TH 0+675. Only the topmost part of the wall is now showing reactivity. This could be a result of the bedrock grouting operations.

- Most thermistors installed upstream of the cut-off wall (0+190, 0+276, 0+336, 0+710) indicate that the temperature trend within the bedrock follows the lake water seasonal temperature variations after July 2019, suggesting the bedrock is fractured and connected to the lake in these areas.
- Upstream thermistor at 0+750: the bedrock was in a permafrost state below El. 148 m and showed only a slight reactivity to lake variations starting in the summer above that. The most variations happen at the interface around El. 151 m. However, the bedrock above El. 143 m thawed after August 2020, suggesting seepage is now going through the upper bedrock in this area. This section of the bedrock was not injected during the grouting campaign is it was still frozen.

Based on temperature profiles and geophysical surveys conducted in 2019, AEM identified the most conductive zones (less latency and most compliance to lake trend) ranking as follows: 0+520, 0+453, 0+310, 0+210 and finally 0+675. The less thermally reactive zones shown by TH 260-360-407-607 confirmed that the potential seepage zone at 0+360 shown by Willowstick was not backed by TH analysis, perhaps because it is in deep bedrock. However, 0+210 showed a seepage zone. In summary, likely seepage zones were identified by thermistors at:

- 0+210
- 0+450 to 0+550
- 0+650 to 0+750

These areas were targeted by the bedrock grouting campaign. Several areas show freezing of previously thawed bedrock (0+260, 0+360, 0+407, 0+520, 0+772), suggesting a reduction in the local seepage rate through the bedrock. On the contrary, some areas previously in permafrost experienced a rapid thawing (0+142, 0+750 upstream). This is likely due to the seepage flow concentrating due to the decrease in conductivity in grouted zones and relocating to previously frozen areas near the abutments.

4.1.2.3 Inclinometers

Four (4) shape-array accelerometers (inclinometers) are installed in the cut-off wall of WTD. Displacements observed are within the OMS values (<50 mm cumulative displacement). Movements with an amplitude of 2 to 3 mm on the longitudinal axis of the dike have been observed at some other locations but are within the instrument precision limit and are such may not be accurate.

There is a seasonal cooling and warming trend observed in the thermistors of the inclinometers that are within the cut off wall, the same is observed on both the piezometers' temperature and thermistor strings. The following observations were made for the different inclinometers:

- INC-0+205: the cut-off wall is moving slightly towards the downstream side (maximum amplitude 25 mm) and slightly towards the west (maximum 15 mm). The movement rate seems to have stabilized since early September 2019, consistently with water head variations on each side of the dike. The thermistor suggests that the upper bedrock is thermally connected to the lake temperature, which is confirmed by nearby thermistor TH-0+210.

- INC-0+366: above the platform at El 154 m, the cut-off wall was moving slightly towards the upstream side until July 2019 (maximum 3 mm) before moving towards the downstream side after that time (maximum 15 mm from the baseline). Between El. 143 and 154 m, the wall is moving towards the downstream side (maximum 6 mm). This behaviour is consistent with water level variations on both sides of the embankment, with the upstream lake level rising rapidly after June 2019. The movement accelerated briefly in September 2019, with no correlation in temperature variations, then stabilized. This area seems thermally connected to the lake as well through the bedrock, as the thermistor shows seasonal variations in the bedrock.
- INC-0+560: the portion of the cut-off wall above the platform at El. 154 m is moving towards the upstream side (maximum 19 mm) and towards the east (maximum 13 mm). The movement rate is correlated with temperature warmup, with a peak acceleration in August 2019 and has stabilized since then with a slow progression back towards the downstream side. A sudden movement towards the downstream direction in September 2019 was observed, as with INC-0+366. The area seems thermally connected to the lake since the end of July 2019, when a rapid warmup of the bedrock occurred and repeated in the summer of 2020. In summer 2020, a rapid warmup was observed within the wall between El. 152 and 155 m, looking like a seepage signature due to the sharpness of the temperature increase. AEM is investigating this observation.
- INC-0+726: above El. 152 m, the cut-off wall was moving towards the upstream side until September 2019 (maximum 27 mm) before switching towards the downstream side after that time and later stabilized. Below El. 152 m, the wall has been continuously moving towards the downstream side. Movement towards the east is observed between El. 145 and 155 m (maximum 19 mm) and towards the west above that elevation (maximum 18 mm). The general movement trend is more pronounced at the bedrock interface. The largest movement rate was recorded in August 2019, which coincides with the bedrock becoming thermally connected to the lake temperature and warming up rapidly. The bedrock has remained thawed since then.

4.1.2.4 Crackmeter

After its installation on August 31, 2019, on a tension crack at 0+716, the crackmeter showed a steady increase in displacement, up to 10 mm before its baseline was compromised on September 9 by a heavy equipment. The increase continued afterwards with a less pronounced trend and the measurements stabilized mid-September with some fluctuations remaining. The maximum displacement rate measured was about 15 mm and the maximum rate of change was about 0.055 mm/h. The instrument was removed on October 21, 2019, after the area froze and the crack stabilized. No more cracks have been observed or monitored since then.

4.1.2.5 Flowmeters

The seepage flow that daylights at the downstream toe of the dike is collected into a trench where several V-notch weirs have been installed. Some areas of seepage are not collected but only visually assessed, accounting for about 100 to 150 m^3/h in 2019. Calculations done by AEM in 2019 based on measured water levels on both sides of the dike suggested that about 200 to 250 m^3/h of the seepage was not observed but instead flowed within the bedrock.

In 2019, the maximum flow rate measured in the V-notch weirs was around 300 m^3/h. In 2020, the maximum flow rate measured decreased to a maximum of 90 m^3/h measured during freshet. The grouting operations seem to have significantly decreased the seepage rate. However, the impact on the non-visible seepage flowing through the bedrock is unknown and it is possible that seepage is now reporting to different areas of the downstream side and are not measured. It is recommended to keep monitoring the areas to detect any new visible seepage, such as the abutments, through which thermal data suggest water may not be flowing.

4.2 WRSF Dike

WRSF Dike is a water retention infrastructure designed to prevent contact water from the Whale Tail WRSF accumulating in the WRSF pond from reporting to Mammoth Lake. The water collected in the WRSF pond located upstream of the dike is pumped to the Attenuation Pond and treated prior to being discharged. An area of approximately 109 ha drains towards the WRSF pond. The WRSF Dike is located south of the Whale Tail WRSF. This structure is a zoned rockfill dike with a filter system. The low permeability element of the dike consists of a bituminous geomembrane installed on the upstream face up the El. 157.8 m and anchored in a key trench with fine filter amended with bentonite. The key trench is excavated in frozen fluvioglacial sand and gravel type material or bedrock.

In the summer of 2019, seepage was observed at the downstream toe of the WRSF Dike, along with tensions cracks and settlement in the crest surface. The upstream pond was pumped out to control the seepage. The seepage mechanism, although not confirmed, was suspected by AEM to be linked with thawing of the foundation below the upstream toe liner tie-in and/or a defect in the liner.

During the winter of 2020, a thermal berm was built on the upstream side of the dike, to promote freezing of the key trench and of the foundation. The thermal berm is composed compacted of sand and gravel, which has been amended with bentonite up to El. 156 m, covered with a rockfill protection layer on the crest and upstream slope. A sump was excavated at the upstream toe of the thermal berm around Sta. 0+300 to pump out the upstream pond water as needed to maintain the water level at the operational level at El. 154 m.

No seepage was observed during the summer of 2020, likely due to the combined effect of the thermal berm and the draw-down of the upstream pond water level.

4.2.1 Field observations during inspection

WRSF Dike was in good condition at the time of the inspection. Old tension cracks and settlement signs were no longer visible. Small tension cracks (up to 5 mm wide) were observed in the thermal berm rockfill surface near the east abutment, as well as one 300 mm wide pothole on the upstream side of the berm around Sta. 0+220. These features are likely due to the rockfill material settling slightly in the slope when construction materials thawed. The condition of the thermal berm should be monitored but is not deemed a concern at this time.

Some water was observed ponding at the downstream toe of the dike. No sign of flow indicating seepage was observed.

Piping was present at the upstream toe for upstream pond level water management, however the pumping system installed in the upstream sump was not active at the time of the inspection.

No pumping was ongoing in the downstream sump at the time of the inspection.

4.2.2 Geotechnical instrumentation data review

Only thermistors are monitoring WRSF Dike (see Appendix I for details). There are nine (9) thermistor strings installed within the WRSF Dike.

These instruments show that:

- the upstream liner tie-in is partly in the active layer (TH-01 and TH-03) while the bentonite-amended fine filter below El. 152 m and the underlying bedrock remains frozen. In early June 2019, a rapid warmup (by up to 11ºC) initiated at the interface between the bentonite-amended fine filter and the coarse filter and extended to the upper portion of the liner tie-in. Mid-August 2019, the beads in the liner tie-in showed another rapid warmup between El. 152 and 155 m (TH-01), corresponding to the materials above the center of the bentonite-amended fine filter. This sudden increase was linked to the observation of a seepage through the dike.
- the rockfill remained frozen below El. 157 m until mid-August 2019, when a spike in temperature (+10ºC over 24 hours) was observed at El. 153 m, which is the same elevation where the warmup was observed in the liner tie-in (TH-01). Although this elevation had the maximum increase, the warming trend was observed between El 156 m to the base of the rockfill, as well as in the bedrock down to 149 m with a slower increase, also linked to the seepage observation. After the thermal berm was built and the upstream pond level was drawn back, the exposed rockfill reacted to seasonal variations (active layer) while the rockfill covered by the thermal berm remained frozen.
- the foundation till (frozen at the time of construction) was thawed at 0+093 and 0+135 in October 2019 (TH-04 and TH-06), while it remained frozen at 0+172 (TH-07). The till in these areas froze back over the following winter and did not that during the summer of 2020. The overburden upstream of the dike at 0+172 was in the active zone (TH-05). The underlying bedrock in these areas remains frozen.
- the foundation bedrock remains frozen below El. 150 m underneath the rockfill. The upper 1 m of bedrock (EL. 150 to 151 m) showed a rapid warmup in the summer of 2019 at the location of TH-02 but froze again during the following winter and did not thaw in the summer of 2020.
- thermistors installed in the upstream thermal berm (TH-08 and TH-09) show that the rockfill is in the active zone but that most of the esker (below El. 156.5 m) as well as underlying materials have remained frozen over the summer of 2020, indicating that the thermal berm is performing as intended.

4.3 North-East Dike

The North-East Dike (NE) dike is designed to prevent non-contact water from the Nemo Lake watershed from reporting into Whale Tail Pit. The NE Dike is located south of the Whale Tail Pit. Water from the pond upstream side of the dike (Lake A47) is periodically pumped out and treated for suspended solids prior to being discharged to the environment. This structure is a zoned rockfill dike with a filter system built in two sections, referred to as the West and East legs. The low permeability element of the dike consists of a bituminous geomembrane installed on the upstream face up to 156.7 m anchored in a key trench with fine filter amended with bentonite. The key trench is excavated in frozen fluvioglacial sand and gravel type material. The liner is covered in a granular material protection layer.

No instrument was installed in NE Dike due to its temporary nature. The dike was dismantled in September 2020 during the development of the IVR open pit.

According to AEM, large settlements were observed in the NE Dike in 2019 and seepage was visible at the downstream toe of both the East and West legs. It is supposed that settlement caused the liner elevation to drop and allowed overtopping of the liner by the upstream pond water.

4.3.1 Field observations during inspection

The NE Dike was in good condition at the time of the inspection. Old tension cracks are disappearing. Settlement of up to about 500 mm was observed on the upstream side of the crest and surface of the upstream liner tie-in between approximately Sta. 0+080 and 0+150 (West leg), and 0+320 and 0+415 (East leg). The settlement appears to be from last year as no new tension crack or deformation is visible.

Blocks and overburden were present on the crest of the East leg, near the west abutment, likely origination from exploration drilling operations nearby, as well as snow removal operations on adjacent Road 3 during which snow piles were pushed against the structure in winter.

Some water was ponding at the downstream toe of the NE Dike, but no sign of flow indicating seepage was observed.

Piping was present on the upstream liner tie-in surface for water management of the upstream pond.

No recommendation is made for this dike given that it is now dismantled.

4.4 Mammoth Dike

Mammoth Dike is a water retaining infrastructure built to isolate the Whale Tail Pit from Mammoth Lake. Mammoth Lake receives water from Whale Tail South Lake through the SWTC, treated water from the Attenuation Pond and from the North-East Sector. Mammoth dike is located across the northeast finger of the Mammoth Lake. This structure is a zoned rockfill dike with a filter system. The low permeability element of the dike consists of a bituminous geomembrane installed on the upstream face up to El. 153.5 m and anchored in a key trench with fine filter amended with bentonite. The key trench is excavated in frozen glacial till or bedrock. The liner is covered in a granular material protection layer.

4.4.1 Field observations during inspection

No geotechnical concern was observed during the inspection. Water was ponding about 20 m away from the downstream toe in the low topographical point. No sign of flow indicating seepage was observed.

4.4.2 Geotechnical instrumentation data review

Only thermistors are monitoring Mammoth Dike (see Appendix I for details). There are three (3) thermistor strings installed within Mammoth Dike.

The instruments show that the foundation bedrock remains frozen underneath the dike, with an active layer above El. 151 to 152 m which was shallower in 2020 compared to 2019. The upstream liner tie-in is frozen below about El. 152 m.

5.0 TAILINGS STORAGE FACILITY

The tailings storage facility (TSF) is located within the dewatered portion of the northwestern arm of Second Portage Lake and consists of the North Cell and the South Cell. The South Cell is comprised of Central Dike, Saddle Dam 3, Saddle Dam 4 and Saddle Dam 5, all built to El. 145 m. The North Cell is comprised of peripheral structures Saddle Dam 1, Saddle Dam 2, RF1 and RF2. Stormwater Dike is an internal structure separating the North Cell from the South Cell. The North Cell was internally raised with the construction of the North Cell Internal

Structure to a variable elevation ranging from 152 to 154 m. A plan view of the TSF is shown in Figure 1 after the text.

A retention basin and a series of diversion ditches surround the catchment basin of the North Cell. These structures are designed to convey surface water runoff away from the TSF. Since 2014, the Western Diversion Ditch has been collected within a retention basin prior to being pumped within the North Cell. This is due to a turbidity problem from the erosion of the side slope and the crest of the ditches. Three temporary retention basins and one ditch are constructed within the North Cell, at the downstream toe of the North Cell Internal Structure to collect seepage through and runoff from this structure. Refer to Section 10.2 for the inspection of these diversion structures.

The North Cell is being progressively closed in sections except for the North Cell Internal Structure which may still receive tailings in the future. Capping continued in 2019 and tailings deposition resumed in the North Cell from August 2018 to July 2019 from the North Cell Internal Structure. The South Cell has now reached almost full capacity, with only limited residual capacity left. Water is transferred as needed from the North Cell to the South Cell to control the water elevation of the North Cell, and excess water from the South Cell is pumped out to Bay-Goose Pit.

In the summer of 2014, the mine constructed an engineered tailings barrier along RF1 and RF2 to mitigate migration of tailings through RF1 and RF2. Refer to Section 10.3 for the inspection of these structures.

The most current version of the TSF OMS manual (AEM 2019b) is dated March 2019. The most current version of the overall Emergency Response Plan for the mine (AEM 2020) is dated June 2020. It is good practice to review these documents each year to keep the information up to date, particularly the 24-hour contact name and phone number.

An inspection of the TSF is performed once a month by AEM. The instruments have been automatically read every three hours since 2017. The monthly inspection reports were reviewed as part of the annual inspection and provided satisfactory information about the evolution of the structures. A summary of the instrumentation data obtained from the TSF is presented in Sections 5.1.2 and 5.7.2 and the data is presented as received from AEM in Appendix C. A revised and updated presentation of the instrumentation data by AEM in 2020 was provided to Golder for review. This revised presentation is clearer than the previous one and allowed for a better interpretation of the instrumentation data. As a result, some interpretations including data trends and depth of active layers are slightly different from those in the inspection reports from previous years. Continued monitoring and review of instrumentation data is recommended. In the case of a significant variation in the instrumentation data, the designer should be notified according to the OMS manual. A significant variation is defined by a change compared to usual seasonal trends and should be followed-up on to monitor the evolution of the event and identify its causes and consequences, as well as the appropriate actions to take.

Figure B1 shows a plan view that indicates the location of the pictures and general observations related to the North Cell and South Cell, as well as the North Cell Internal Structure. Figure B2 contains a plan view that shows the location of the photos and observations noted on Stormwater Dike. Figure B3 contains a plan view that shows the location of the photos and observations noted on Saddle Dam 1, Saddle Dam 2 and Saddle Dam 3. Figure B4 contains a plan view that shows the location of the photos and observations noted on Central Dike, Saddle Dam 5 and Saddle Dam 4.

5.1 General Observations of the Tailings Facility

5.1.1 Field observations during inspection

Per the TSF design and the standard operating practices, captured in the OMS manual, a tailings beach must be present at all times against all peripheral structures.

At the time of the inspection, the pond of water in the North Cell was located towards the centre of the facility and there was a tailings beach against the peripheral structures to protect them from ice in the winter and to prevent the migration of water out of the TSF (see Figure 1 for an approximate location of the tailings beach). The tailings elevation in the North Cell varied between approximately El. 149.5 m and 152.1 m and the pond elevation was at El. 146.46 m. The tailings beaches against the structures of the North Cell were adequate. The North Cell Internal Structure is built partially on the North Cell tailings and partially on the rockfill cover placed over the last few years for closure operations. At the time of the inspection, tailings deposition had recently stopped in the North Cell and water was still channeling from the deposition points towards the reclaim pond in the south part of the North Cell. It was observed that channelling was occurring against the dike toe and that this caused erosion of the filter material (see Section 5.4.1).

At the time of the inspection, the tailings elevation varied between approximately El. 132 and 144.6 m in the South Cell and the pond elevation was at El. 141.09 m. Water in the South Cell was ponding against the south part of the downstream toe of Stormwater Dike, while a tailings beach developed against the rest of Stormwater Dike. This is a favourable point for South Cell closure and environmental aspects, given that it is inferred that the Stormwater Dike foundation presents some open windows of exposed fractured bedrock that may contribute to feeding the seepage at Central Dike. A tailings beach developed against the majority of Central Dike and Saddle Dams 4 and 5. Water was observed ponding against the liner in the corner of Central Dike and Saddle Dam 5. AEM reported that a large quantity of ice formed in this area during the last winter. At the time of the inspection, no tailings deposition was done in the South Cell, as deposition was now done in the pits.

At the time of the inspection, Saddle Dams 3, 4 and 5 were operational, with water ponding against the erosion protection of Saddle Dam 3 and tailings deposited against Saddle Dams 4 and 5. Permanent sumps have not yet been installed on the downstream side of Saddle Dam 4 and Saddle Dam 5, and water accumulation is pumped as required. A permanent sump is in operation on the downstream side of Saddle Dam 3. It is important that the water level on the downstream side not be allowed to rise higher than the granular layer of the upstream toe liner tie-in to prevent uplifting of the geomembrane.

No depressions in the tailings have been observed this year during the inspection, nor reported by AEM.

Photographs of the TSF's North Cell and South Cell are provided in Appendices B1 to B7.

5.1.2 Geotechnical instrumentation data review

Nine thermistors are installed in the tailings of the North Cell of the TSF, as detailed in Appendix I (Table 12). Plots of their data are presented in Appendix C. They indicate that the tailings in the North Cell are not entirely frozen, including in the talik area where the reclaim pond was kept during operation.

NC-T1 shows that the tailings and the bedrock did not freeze between September 2019 and September 2020 below El. 125 m, with temperatures ranging between 0°C and 1.5°C. The unfrozen conditions are attributed to the presence of the supernatant water pond near the Saddle Dams close to the instrument, and the fact that it was always within the supernatant pond during tailings deposition.

NC-T2 shows that the tailings and the bedrock did not freeze between September 2019 and September 2020 below El. 140 m, with temperatures ranging between 0°C and 8.5°C. The unfrozen conditions are attributed to the location of the instrument directly within the supernatant water pond. Between El. 140 m and 143 m, tailings remained frozen. An active layer is present in the tailings above El. 143 m.

NC-17-01 shows that the tailings and bedrock remained frozen between September 2019 and September 2020, with temperatures ranging between 0°C and -17°C.

NC-17-02 shows that the tailings and the bedrock did not freeze in 2020 below El. 110 m, with temperatures ranging between 0°C and 1.5°C. The unfrozen conditions are attributed to the presence of the supernatant water pond near the Saddle Dams close to the instrument.

NC-17-03 shows that the tailings and the bedrock did not freeze in 2020 below El. 140 m, with temperatures ranging between 0°C and 1.5°C. The unfrozen conditions are attributed to the presence of the supernatant water pond between RF1 and RF2 close to the instrument.

NC-17-04 shows that the bedrock remained frozen in 2020 below El. 132 m, with temperatures ranging between 0°C and -3°C. Another zone located in the tailings between El. 142 and 148 m remained frozen, with temperatures ranging between 0°C and -22°C. The lower part of the tailings above the bedrock interface (between El. 132 m and 142 m) froze in winter with a seasonal warmup in the summer of 2020, similarly to 2018 and 2019. This is consistent with the observations of a talik zone made when the reclaim water pond was present at this location during operations. An active layer is observed in the tailings above El. 148 m.

NC-17-05 shows that the tailings remained frozen in 2020 except at the bedrock interface at El. 152.5 m, where tailings warmed up to slightly above 0°C in the summer of 2020. No active layer was observed in the tailings and the bedrock except one node at El. 116 m which reached 0.8°C in October 2019.

NC-17-06 shows that the tailings and the bedrock remained frozen in 2020 below El. 145 m, with temperatures ranging between -13°C and 0°C. An active layer is observed in the tailings above El. 145 m.

NC-17-07 shows that the tailings and the bedrock remained frozen in 2020 below El. 145 m, with temperatures ranging between -13°C and 0°C. An active layer is observed in the tailings above El. 145 m.

NC-17-08 shows that the tailings and the bedrock did not freeze in 2020 below El. 140 m, with temperatures ranging between 0°C and 2.5°C. The unfrozen conditions are attributed to the location of the instrument directly within the supernatant water pond.

The temperature profile measured in thermistor SWD-01 is discussed in the next section.

5.2 Saddle Dam 1 – North Cell

Saddle Dam 1 is located in the northwestern corner of the TSF and forms one of the perimeter structures of the North Cell intended to retain tailings and supernatant fluid during the operation and the closure of the TSF. Saddle Dam 1 crosses a depression between the northwestern arm of Second Portage Lake and Third Portage Lake.

Saddle Dam 1 is a rockfill embankment with an 3H:1V upstream slope and a 1.3H:1V downstream slope. This structure has inverted base filters, upstream graded filters, and a linear low-density polyethylene (LLDPE) geomembrane liner on the upstream dike face. The geomembrane liner is placed between an upper and lower non-woven geotextile layer for protection, and is covered by approximately 0.3 m of granular material up to El. 140 m. No granular layer was placed above El. 140 m and the liner is exposed above that elevation. According

to the design, a tailings beach has to be maintained on the face of the structure to reduce the potential for ice damage to the liner. The abutments are founded on bedrock, while the central portion of the dike is founded on ice-poor soil. Till and/or crushed aggregate mixed with dry bentonite powder have been placed above the toe of the liner.

5.2.1 Field observations during inspection

During the inspection, it was observed that Saddle Dam 1 is performing well and does not show any geotechnical concern. An adequate tailings beach was observed along the upstream face of Saddle Dam 1. A stockpile of fine filter material has been present on the north part of the dike since 2011 and poses no geotechnical concern.

A permanent dewatering pump is installed downstream within a seacan container. Water was observed ponding near the sump. Pumping was done during freshet, and as necessary during summer. The environment department is monitoring the water quality during the year and this information is shared with the engineering department. The water quality results indicate that the water is not seepage from the North Cell. Given that the foundation of Saddle Dam 1 is now frozen and therefore the weight of tailings will preclude any liner heave, it will be possible at a later stage to remove this pumping station and to backfill the toe drain trench to allow natural drainage of the water toward Third Portage Lake. However, as this sump is a permanent feature, it is required that the water quality remains monitored and be reported; the sump therefore cannot be backfilled during operations in order to comply with legal requirements.

A photographic log and the record of inspection form for Saddle Dam 1 is provided in Appendix B2.

5.2.2 Geotechnical instrumentation data review

Four (4) thermistor strings (T1, T2, T3 and T4) are installed on Saddle Dam 1 and are automatically read every few hours following the installation of dataloggers in 2017. Three thermistors (T1, T2, T3) are installed to monitor the thermal condition within the structure and its foundation. The fourth thermistor string (T4) is installed along the upstream face of the dam to monitor the thermal condition of the tailings. The location of the instrumentation is shown in Appendix C3.

Instrumentation on Saddle Dam 1 comprises thermistors, as detailed in Appendix I (Table 9). Thermistor data from within the structure indicate that the dike foundation remained frozen from September 2019 to September 2020. The foundation soil and bedrock remained in a frozen state with temperatures ranging from about -1.3°C to -5°C. At the upstream toe, below El. 132 m, the compacted till base material below the liner remained frozen. The majority of the rockfill shell remained frozen during the reported year as the active layer was 2 m, above El. 146 m. The instrumentation indicates that the structure is behaving as expected with data following historical trends.

No sign of seepage or thawing of the foundation soil can be observed from the instrumentation data. The structure is performing as expected.

Plots of the Saddle Dam 1 thermistor data are presented in Appendix C.

5.3 Saddle Dam 2 – North Cell

Saddle Dam 2 is located along the western side of the TSF and connects to the western corner of Stormwater Dike. Along with Saddle Dam 1, it forms one of the perimeter structures of the TSF's North Cell that retain tailings and supernatant fluid during the operation and closure of the TSF. Saddle Dam 2 crosses a depression between the northwestern arm of Second Portage Lake and Third Portage Lake.

The upstream foundation of the dike and abutments are primarily founded on bedrock; however, some portions of the structure, underneath the inverted filter, are founded on ice-poor soil. During construction, a thin layer of low permeability till was placed and compacted along the toe liner tie-in connection with bedrock. A thin layer of crushed aggregate (0 to 22 mm) mixed with dry bentonite powder was also placed under the thin layer of low permeability till in areas where open factures were observed within the bedrock. The toe liner tie-in was then covered with till.

5.3.1 Field observations during inspection

During the inspection, it was observed that Saddle Dam 2 is performing well and does not show any geotechnical concern, besides the presence of a wooden pallet on the liner at Sta. 20+475 that should be removed to avoid damaging the liner. An adequate tailings beach was observed against the upstream side of the structure.

During the inspection, some water was observed ponding on the downstream side within the rockfill embankment (between approximately Sta. 20+275 and Sta. 20+475), although in lower amounts than in 2019. This water has been observed since the 2015 annual inspection and the instrumentation indicates that the foundation remains frozen. Per AEM, water has been ponding at that location for a long time. The water is run-off water and is tested by the environmental team regularly during open water season.

A photographic log and the record of inspection form for Saddle Dam 2 is provided in Appendix B3.

5.3.2 Geotechnical instrumentation data review

Four (4) thermistor strings (T1, T2, T3, and T4) have been installed at Saddle Dam 2 to monitor the thermal condition within the structure and its foundation. The location of the instrumentation is shown in Appendix C3.

Instrumentation on Saddle Dam 2 comprises thermistors, as detailed in Appendix I (Table 10).

Thermistor data from within the structure indicates that the dike foundation remained frozen from September 2019 to September 2020 with temperatures ranging from -4°C to -9.4°C. At the upstream toe of the dike, the semi-pervious backfill remained frozen during the year. The rockfill mostly stayed in frozen condition with an active layer above El. 148 m. The instrumentation indicates that the structure is behaving as expected with data following historical trends.

No signs of seepage or thawing of the foundation soil were observed. The structure is performing as expected.

Plots of the Saddle Dam 2 thermistor data are presented in Appendix C.

5.4 North Cell Internal Structure – North Cell

The North Cell Internal Structure is located within the North Cell of the TSF, in its northern section. It is built over the existing tailings of the North Cell and the rockfill cover placed over the last years for closure operations.

The North Cell Internal Structure is designed and constructed as a permeable zoned rockfill dam with filter zones, built on the top surface dried tailings of the North Cell and on the existing rockfill cover. The bulk part of the North Cell Internal Structure consists of coarse rockfill material. The upstream face is designed at a 3H:1V slope and the downstream faces are designed at a 1.5H:1V slope. The upstream face of the North Cell Internal Structure comprises two granular filter zones. The filter zones are designed to prevent tailings migration and internal erosion, while allowing water to flow through the embankment. A system of ditches and sumps at the downstream toe of the structure is designed to collect seepage and runoff water.

5.4.1 Field observations during inspection

No tailings deposition had been done from the North Cell Internal Structure in 2020. The supernatant water is flowing well toward the west side of Stormwater Dike, where water is transferred into the South Cell. Channelling of water has been observed since 2019 at the upstream toe of the eastern part of the dike. The water flow is eroding fine filter material at the toe. There is water ponding at the upstream toe between approximately Sta. 2+460 and 2+940. A pipe is also discharging water close to the toe very close to the slope around Sta. 2+400.

Sloughing was observed at approximately Sta. 3+100, where the fine filter was missing in a 1 m wide circular area, exposing the underlying coarse filter layer. The coarse filter was still in place and showed no sign of erosion. The sides of the failure scar in the fine filter were still eroding. Water was observed flowing at the base of the opening through the coarse filter from the downstream toward the upstream. The shallow water ponding at the downstream toe of the North Cell Internal Structure in its eastern section appears to be feeding this flow. No water was deposited by AEM in this area over the past year. Since the filter system is open in this area, it is recommended to repair the fine filter layer and to protect it or cap it. AEM has indicated that a remediation plan is under preparation.

Deformation was observed in the upstream slope around Sta. 2+260, where the toe of the slope seems to have moved toward the upstream side of the dike. This section of the North Cell Internal Structure was built partly on the existing capping (crest) and partly on the tailings (upstream slope), it is therefore possible that this deformation results from settlement in the soft tailings foundation or melting of entrapped ice in the tailings and rockfill. The filter system in this area is still expected to perform well, as no cracks or opening are present in the transition layers.

Tension cracks (several meters long, 10 to 150 mm wide) have been observed during the inspection in the fine filter surface between Sta. 2+300 and 3+150 m. Cracks are parallel to centreline and are mostly located between the middle and the bottom of the upstream slope, with narrow cracks on the crest of the fine filter at Sta. 2+780. The area showing tension cracks has expanded compared to 2019, where cracks were limited to the section where the toe of the slope was undercut by erosion from the channelling water. The cracks are located in the fine filter layer only, therefore they do not suggest an instability of the structure. However, they need to be monitored and repaired as they may decrease the efficiency of the filters in case of further tailings deposition. It is recommended to protect the filters in the areas showing deformation or to start capping this area as part of the closure plan.

Linear erosion features were observed at several locations in the upstream surface, where the fine filter has started to wash out from the crest to the toe of the upstream toe. They were likely caused by large volumes of water draining from the crest during freshet, as no water discharge had been done in these areas.

The pumping stations on the downstream side of the dike are in place and working as needed. AEM indicated that the incoming water is from run-off and not from seepage. The capacity of the North Cell to store the inflow design flood must be ensured continuously during tailings deposition.

A photographic log and the record of inspection form for the North Cell Internal Structure is provided in Appendix B1.

5.4.2 Geotechnical instrumentation data review

Four (4) vertical thermistor strings were installed on the crest of the North Cell Internal Structure, with three (3) of them in operational order, as detailed in Appendix B-1 (Table 8). NCIS-01, NCIS-02, NCIS-03 and NCIS-04 show frozen tailings and an active layer within the entire layer of rockfill.

Sixteen prisms are installed on the crest of the North Cell Internal Structure. Prisms were not read in 2020 due to the lack of visible deformation on the crest.

Plots of the North Cell Internal Structure thermistor data are presented in Appendix C.

5.5 Stormwater Dike

Stormwater Dike is an internal structure that subdivides the TSF into the North Cell and the South Cell within the dewatered northwestern arm of Second Portage Lake. Stormwater Dike cannot be considered as a temporary structure anymore, as it is planned to not fill the South Cell to the same elevation as the North Cell. Therefore, there will remain an elevation difference between tailings elevations on both sides. For this reason, it is recommended to review the design basis criteria and assess whether the actual dike configuration and construction still meets the design criteria and will continue to behave in a satisfactory manner in post-closure conditions. The work could be carried out by the EoR, but should be revised by the original dike designer.

In this document, the North Cell side is taken as upstream and the South Cell side as downstream.

Stormwater Dike is a rockfill embankment structure. The upstream slope is approximately 3H:1V and the downstream slope is about 1.3H:1.0V. A bituminous geomembrane liner has been installed above the graded filters on the upstream face of the dike. Low permeability till was placed and compacted along the upstream toe of the dike as a tie-in of the liner.

The majority of the dike is seated on dense till from the former lakebed within the talik, with lakebed sediments still present in some areas, while the abutments are generally founded on bedrock.

5.5.1 Field observations during inspection

Since 2016, tension cracks and signs of settlements have been noticed on the crest of Stormwater Dike in a repeated pattern over the years. The most probable mechanism of the movement is settlement due to the thawing of soft sediments caused by the rise of ponding water in the South Cell through the Stormwater Dike foundation. To mitigate against a possible foundation failure, a rockfill buttress support was constructed at the downstream toe of Stormwater Dike in the South Cell (from approximatively Sta. 10+300 to Sta. 10+700). After the movement had stopped during each episode, the cracks were filled with bentonite. This is a good practice to limit water infiltration within the cracks.

No cracks or deformations were observed on Stormwater Dike at the time of the inspection. The structure was in good condition. Some discarded materials were stored at the east entrance of the dike and should be removed.

During the annual inspection, the downstream toe of the dike was not visible as it has been entirely covered by tailings and the South Cell pond. On the upstream side, capping was very close to the dike

A photographic log and the record of inspection form for Stormwater Dike is provided in Appendix B4.

5.5.2 Geotechnical instrumentation data review

Two thermistors, one piezometer and 20 prisms are monitoring Stormwater Dike, as detailed in Appendix I (Table 13). Extensometers and crackmeters previously in place have been removed.

SWD-01 is installed on the upstream side of Stormwater Dike within the North Cell tailings. This thermistor shows that the tailings and the bedrock did not freeze between September 2019 and September 2020 below El. 132 m with temperatures ranging between 0°C and 2.2°C. The unfrozen conditions are attributed to the presence of the supernatant water pond close to the instrument which prevents freeze-back of the existing talik zone. The temperature readings indicate that the tailings between El. 132 m and 147 m stay frozen throughout the year. No active layer was observed in 2020, contrary to the previous years.

SWD-03 is installed on the downstream side of Stormwater Dike (approximately Sta. 10+690 m) within the stabilization buttress and is covered by the South Cell reclaim pond. This thermistor shows that the till remained frozen between September 2019 and September 2020 between El. 120 and 114 m, while the bedrock thawed along with the till below El. 114 m. Above El. 120 m, the measurements show that the overlaying till, lakebed sediments, and rockfill did not freeze. A global slow warming trend seems to be observed at all depths in this instrument.

The piezometers show a trend in pore water pressure that used to follow the evolution of the water level in the South Cell reclaim pond but have disconnected from it in March 2020, with pressure decreasing until May 2020 when both instruments recorded a sharp increase in pressure (+14 m in PZ-SWD-03-A and +10 m in PZ-SWD-03-B). This pressure has since dissipated. It is recommended to be on the watch for other unusual fluctuations in these instruments. These two instruments have been below 0°C almost since they were installed but warmed up rapidly in the summer of 2020, which could be linked to the unusual behaviour observed over the summer of 2020.

Prisms have not been read in 2020 due to the lack of visible deformation.

Plots of Stormwater Dike thermistor and piezometer data are presented in Appendix C.

5.6 Saddle Dam 3, Saddle Dam 4 and Saddle Dam 5 – South Cell

The South Cell of the TSF consists of four perimeter structures: Central Dike, Saddle Dam 3, Saddle Dam 4 and Saddle Dam 5. Saddle Dam 3 is located in the northwestern corner of the South Cell and is merged into Saddle Dam 2. Saddle Dam 4 is located in the southwestern corner of the South Cell and is merged into Saddle Dam 5, which merges with the southern end of Central Dike.

Saddle Dams 3, 4, and 5 are designed and constructed as zoned rockfill dams with filter zones, low permeability upstream liners, and upstream toe liner tie-in key trenches. Cross-sections of Saddle Dams 3, 4 and 5 consist of a rockfill embankment, constructed from run-of-mine waste rock, placed in lifts and compacted. The upstream faces are designed at a 3H:1V slope and the downstream faces are designed at a 1.5H:1V slope. The upstream faces of Saddle Dams 3, 4 and 5 are comprised of two granular filter zones and a LLDPE liner extending along the upstream foundation. The filter zones are meant to keep the tailings inside the facility in a case of liner puncture, but mainly act as appropriate bedding for the liner. An upstream liner tie-in key trench excavated to bedrock and filled with compacted till is located along the upstream area of the structures.

5.6.1 Field observations during inspection

At the time of the inspection, all dikes were operational. The water level of the South Cell was above the upstream toe of the erosion protection cover of Saddle Dam 3. No geotechnical issues were observed with these structures. A section of pipe was present on the liner in the upstream slope of Saddle Dam 4 and should be removed to avoid damaging the liner.

During the inspection, water was observed ponding in some areas of the downstream side of Saddle Dam 4 and Saddle Dam 5. As the downstream toe is higher than the South Cell pond along Saddle Dam 4 and Saddle Dam 5, this water does not come from the TSF. On the downstream side of Saddle Dam 3, in the sump, water is ponding at a level below the South Cell elevation. It is important to maintain the water level on the downstream side lower than the level of the upstream toe liner tie-in granular material layer to prevent uplift of the geomembrane. As the elevation of the downstream side is lower than the elevation of the granular material, this should not be a problem if the downstream water level is managed.

A photographic log and the record of inspection forms for Saddle Dams 3 and 4 is provided in Appendices B5 and B6. A photographic log and the record of inspection form for Saddle Dam 5 is provided in Appendix B7.

5.6.2 Geotechnical instrumentation data review

Five (5) thermistors are installed at Saddle Dam 3 with three (3) of them operational in 2020, as detailed in Appendix I (Table 14). These thermistors are mostly in permafrost condition, with the bedrock frozen all year. It will be important to keep following the performance of the structure as Saddle Dam 3 is operational for containment of supernatant water.

Four (4) thermistors are installed at Saddle Dam 4 with three (3) of them operational in 2020, as detailed in Appendix I (Table 15). These thermistors are mostly in permafrost condition, with the bedrock frozen all year. The beads in the bedrock for SD4-T4 (in the upstream toe liner tie-in) should be repaired.

Three (3) thermistors were installed at Saddle Dam 5, as detailed in Appendix I (Table 16). SD5-T4 shows frozen bedrock and rockfill up to El. 142.5 m, while SD5-T2 further downstream indicates that the bedrock and the rockfill are mostly frozen up to El. 140 m with temperatures between -7°C and 0.2°C. SD5-T3 indicates that the bedrock and the compacted till of the tie-in are frozen up to El. 140 m.

5.7 Central Dike – South Cell

Central Dike is located along the eastern side of the TSF and crosses a depression within Second Portage Lake. Along with Saddle Dam 4 and Saddle Dam 5, Central Dike forms one of the perimeter structures of the South Cell.

Central Dike design includes a compacted rockfill embankment with an upstream seepage barrier, granular filters and a key trench along the centreline of the dike transitioning on the upstream toe near both abutments. The foundation soils include lakebed sediments and till overlying bedrock. Soft and ice-rich soils were removed from the Central Dike footprint during construction.

5.7.1 Field observations during inspection

During the inspection, water was observed ponding at the downstream toe of the dike between approximately Sta. 0+300 and the southern access road at Sta. 0+830. Seepage into the basin at the downstream toe of Central Dike has been observed since 2014 when tailings deposition was transferred from the North Cell of the TSF to the South Cell. The rate of seepage increased proportionally to the rise of the pond level of the South Cell. Field

investigations coupled with seepage-stability analyses indicated that the seepage is mainly controlled by openings in the bedrock and that the dike is physically stable. The decrease of the South Cell water level and use of tailings to seal the bottom of the cell reduced the seepage rate, which was 110 m^3/h at the time of the inspection and stable (see Section 5.7.2).

During the spring, the water in the downstream pond reportedly had an orange coloration with high turbidity, similarly to the previous years. This event is monitored by AEM and has been attributed to precipitation of iron oxide from bacterial processes.

Central Dike is in good condition. At the time of the inspection, there was a tailings beach against the entire length of the structure except the southern part, from Sta. 0+850 m, where water is ponding on the LLDPE liner. Stormwater Pond was being pumped out into the South Cell at the time of the inspection, and the discharge was located at the corner of Saddle Dam 5 and Central Dike, adding water to the pond. AEM is planning to remove the water ponding in this area as per the design requirements.

There is angular granular material (fine filter) in direct contact with the LLDPE liner at approximately Sta. 0+750 m. A cable with a metallic plug at Sta. 0+900 m was also observed against the LLDPE liner. It is recommended to clean these items in order to avoid risk of perforation. This operation is required regularly and should be detailed in a procedure prepared by AEM. The procedure needs to be communicated to all concerned workers and added to the OMS manual.

A photographic log and the record of inspection form for Central Dike and Saddle Dam 5 is provided in Appendix B7.

5.7.2 Geotechnical instrumentation data review

Instruments were installed on Central Dike to monitor the dike's performance during its construction, operation, and closure. At the time of the inspection, the instrumentation on Central Dike consisted in a total of 69 piezometers and 20 thermistor strings installed in 20 boreholes, as detailed in Appendix I (Table 17). Some additional instruments were installed later in October 2020 to replace broken ones. The new instruments had only a few weeks of data at the time of the data review by Golder. The new piezometers seemed to be still stabilizing, while the thermal data was consistent with nearby instruments.

The following presents a summary of the data collected from September 2019 to September 2020 for the piezometers and the thermistors. Data plots for the instrumentation sent by AEM are presented in Appendix C.

5.7.2.1 Thermistors

The thermistors are showing similar trends as in the past. The following observations of the thermistor data can be made:

- The instruments installed along the central key trench (580-P1, 595-P1, 750-P1, 825-P1) show thawed conditions (between 1.1°C and 3.1°C) within the rockfill, the till and the bedrock (from El. 110 m to 65 m).
- The instruments installed along the downstream toe of the Central Dike footprint for a final crest elevation of 150 m indicate that the till unit at 545-P2 stayed frozen in 2019-2020, while part of the bedrock foundation did not freeze (between 0°C and 0.1°C between El. 82 m and 75 m, and between 0°C and 0.3°C below El. 63 m). At 650-P2 however, the entire till and bedrock units remained thawed (between 0.5°C and 1.1°C).

- Throughout the year, temperature variations up to 1°C can be observed for each bead, except in rockfill near the surface (up to 10 m deep) where the amplitude is larger. The bedrock temperature from El. 105 to 55 m varies from -6°C to -4.4°C at 465-P3, from -3.7°C to -0.8°C at 650-P3 and from -0.5°C to 1°C at 875-P3. This seems to indicate that a permafrost condition has developed in part of the Portage Pit wall, while the part aligned with the south abutment of Central Dike generally did not freeze below El. 67 m during the year, although temperatures show a slow cooling trend within the bedrock.
- Thermistors 875-P3 and 975-P3 installed near portage Pit show that the bedrock remained unfrozen below approximately El. 100 m, with temperatures ranging from 0°C to 1°C. The node at El. 75 m in 875-P3 is starting to freeze in 2020.
- The thermistor installed in the West Road (745-P3) indicated that the rockfill stayed unfrozen above El. 123 m, while it was frozen all year long between El. 121 and 123 m. Temperatures slightly above 0°C are recorded in the dense till between El. 102 and 104 m over the summer each year since 2017, while frozen conditions are observed the rest of the year. The rockfill and dense till between El. 104 and 123 m are no longer monitored as beads are either broken or capacitive but were previously observed to stay frozen all year long, suggesting that this instrument is at the limit of the permafrost downstream of Central Dike.

These observations tend to confirm the visual observation of seepage downstream as the foundation of the dike (till and bedrock) on the downstream side are unfrozen all year. Till and bedrock temperature tend to decrease further from the downstream side and the piezometers near Portage Pit show permafrost condition.

5.7.2.2 Piezometers

The general piezometric trend is stable. Most instruments are correlated with the downstream pond elevation.

It can be observed that the piezometers located in boreholes between Sta. 0+595 and Sta. 0+875 are strongly reacting to the level of the water pond located downstream of Central Dike. In those boreholes, the 23 piezometers that are non-frozen and not in suction are recording piezometric elevation around El. 115 m, the downstream pond level. The piezometers between Sta. 0+595 and Sta. 0+875 located in the rockfill, till and bedrock are reacting similarly, which seems to indicate a hydraulic connection between the downstream pond, the till and the bedrock. The piezometric elevation recorded in the till and the bedrock between Sta. 0+595 and Sta. 0+875 is generally slightly higher than the elevation of the downstream pond, indicating excess pore water pressure or more a higher seepage flow. Piezometers 650-P2 and 875-P3 are the only instruments that seem to react to the South Cell level instead of the downstream pond level. Piezometer 650-P2-A has been on the rise since December 2015, with a deceleration of the increase after 2018, and the measured piezometric elevation exceeds the South Cell pond elevation. This instrument may need to be doubled to confirm this trend. Piezometers 875-P3-A and B are still on the rise despite the stabilization of the South Cell level, and exhibit small reactions to the downstream pond variations. Pressure in piezometer 875-P3-B now exceeds the pressure measured in 875-P3-A. Piezometers at 875-P3 are also the only instruments in the P3 zone that are recording an upward trend.

The piezometers located between Sta. 465 and Sta. 580 are not reacting to the downstream pond water level or the elevation of the South Cell and indicate much lower piezometric elevations. The exception to this observation used to be piezometer 545-P1-D, located in the till, which is no longer functional. Piezometer 700-P1-B also exhibited a large increase in piezometric elevation between July 2017and December 2018 but has since stabilized and is now on a slow decrease with reaction to the downstream pond variations.

Piezometers 595-P1-B and C still exhibit a unique trend consisting in two subsequent spikes in the fall and in winter (5 and 10 m in 2019-2020, similar to the previous year), followed by a progressive pressure decrease until the summer, returning to normal levels. This is the same pattern than in the last two years and the amplitude of the phenomenon appears stable. These instruments are installed in the bedrock, with remaining casing.

Generally, a downward hydraulic gradient in part of the bedrock and of the till can be interpreted in piezometers located in the same boreholes. Small upward gradients in the till or the upper bedrock can also be observed in some boreholes, such as 580-P1-R, 750-P1 and 810 P-1. Significant upward pressure gradients in the bedrock can be observed in holes 545-P1, 545-P2, 700-P1, 825-P1 and 850-P1. It is not possible to observe a generalized upward hydraulic gradient trend that would indicate that pressurized bedrock is transmitting pore water pressure to the till. The piezometric elevation in the bedrock is often similar to or smaller than recorded in some parts of the till layer. However, due to the topography, it is possible that water is reporting from bedrock located higher and induces excess pore water pressure on the foundation soil located lower below.

Some instruments were broken or malfunctioning, as detailed in Appendix I (Table 17). Those instruments give either no data or erratic data. A piezometer that has frozen once cannot be relied upon even if it thawed, as freezing generally breaks the piezometer or shifts its calibration curve. It is recommended to flag these piezometers and be careful when interpreting their data even if they seem probable.

As in previous years, it can be observed that some piezometers are recording negative pressure (suction). Negative pressure for unfrozen conditions was recorded in seven piezometers, as detailed in Appendix I (Table 18). Piezometers in suction are recording very few variations in measured pore water, while the other instruments are reacting to the downstream pond elevation. These instruments are generally located in the bedrock. Based on the available information, it is not possible to determine the exact cause of this suction. This could be due to a problem with the instruments or to a non-continuous geological environment in which the water table is located locally below the installation depth of some of the instruments. The results of these instruments must be interpreted with caution.

5.7.2.3 Flow Meters

At the time of the inspection a seepage flow of approximately 110 m^3/h was pumped out to maintain the downstream pond at El. 115 m, compared to 308 m^3/h in 2019. Water inflow from this location has been pumped back to the South Cell, then to Pit E since February 20, 2020, to avoid ice build-up upstream of the dike. Pumping out water from the South Cell combined with an adapted tailings deposition plan effectively reduced the amplitude of the seepage over the last years and the seepage appears stable since 2019. AEM indicated that the flow had decreased to 50 m^3/h in winter of 2020, similar to last year.

5.7.2.4 Seismograph

Seismograph monitoring of blast vibrations on the crest of Central Dike has occurred at four locations along the dike for every blast at Portage Pit. The maximum allowable PVS for all dikes is set at 50 mm/s as per the designer's recommendations. No blast was done in the reported period since mining activities were terminated at the Meadowbank site.

5.7.2.5 Turbidity and Water Quality

The turbidity of water in the downstream pond has been monitored from 2015. The turbidity of the downstream pond usually increases with the pump speed. Turbidity was below the threshold value of 15 mg/L for

environmental discharge from September 2019 to September 2020, except for the first two weeks of June 2020. The seepage pond water was discharged in the South Cell, then in the pits.

In the freshet of 2019, similar to the summer of 2017 and 2018, a change in the water coloration was observed in the downstream pond. The water turned orange and back to normal several times in the cycles. An orange sludge was observed on the surfaces below the water level. No change in pH was measured but turbidity increased during the summer. Per AEM, the available results from chemical analyses indicate that no tailings are present in the downstream pond and that the coloration is linked to natural bacterial processes.

6.0 ALL-WEATHER ACCESS ROAD

The All-Weather Access Road (AWAR), formerly referred to as the All-Weather Private Access Road, was built in 2007-2008 to connect the hamlet of Baker Lake to the Meadowbank Mine site. The road is approximately 107 km long with nine bridge crossings and culverts installed at a total of thirty-eight locations. Each structure along the AWAR, their designated name, their approximate location, and the observations noted during the inspection is provided in Appendix D1.

The road design is based on a general rockfill sub-base and crushed granular rockfill surfacing with a combined minimum thickness of 1 m over thawed stable soil and 1.2 m over thawed susceptible soil.

No sign of thermal degradation of the permafrost was observed on the road during the inspection. It should be noted that signs of thermal degradation may not necessarily be observed due to the regular road maintenance performed by AEM. During the inspection, water levels and flow velocities at the crossings were normal for the time of year.

Fill material that comprises the majority of the road provides no significant barrier to low gradient water flow due to its coarse nature. During higher flow and runoff periods, water may flow through portions of the road fill. Water was observed flowing through the rockfill near four culverts during the inspection, and signs that water flowed beneath the road were observed at some other locations during the inspection. This could also be due to the inlet or the outlet of some culverts having been installed too high or too low, which did not promote the flow of water through the culvert until a certain water level had been reached.

During the year, AEM conducts regular and event-based visual inspections of the fish-bearing water crossing locations along the access road. This data should continue to be compiled by AEM to confirm the hydraulic function of the crossings, the adequacy of the crossing locations with respect to the watercourses, and minimal impact to fish habitat.

It is understood that AEM’s monitoring program includes an assessment of sedimentation and potential erosion issues at the major bridge crossings. Consideration should be given to expanding AEM’s monitoring program to include all culverts and bridges along the road to assess whether they are providing adequate capacity during the freshet and following large precipitation events.

6.1 Culverts

The culverts were generally in good condition at the time of the inspection. No significant degradation of culvert conditions has been observed when compared to the 2019 inspection. Most culverts were unobstructed with no

signs of erosion and no signs of damage to the culverts. Many sections of the road that were not equipped with culverts showed accumulation of ponding water against the sides of the road.

Culverts in the following discussion, and in the photographic log, have been identified by name (e.g., R-24) to be consistent with those indicated on the as-built drawings provided by AEM. Each culvert is also identified by its approximate kilometre location (e.g., km 98+250) along the road alignment.

Signs indicating that minor erosion has occurred were observed at the inlet of PC-17A (8+830), and at the outlet of R14 (km 67+840) and R24 (km 98+100). No action is recommended for the culverts showing sign of erosion as the situation seems stable. Culvert erosion progression should be monitored at freshet.

During the inspection, signs of water flowing beneath the road were observed at some locations. This is generally due to the inlet or the outlet of the culvert having been installed too high or too low, which did not promote the flow of water through the culvert until water reached a certain level. This condition can promote erosion and risk of washout beneath the road and should be monitored. This situation has been observed in the past and seems to be stable as no signs of deteriorating conditions were observed. This condition was observed at PC-17A (8+830), PC-11 (39+552), R-14 (67+840), R-18B (82+500), R-20 (85+490), and R-23 (93+600). PC-11, PC-17A, R-20 and R-23 showed a flow of water during the inspection. The progression of the situation should be monitored at freshet.

Obstructed and damaged culverts were observed at some locations during the inspection. In many cases, the obstructions are related to inlets and/or outlets becoming partially or completely obstructed by accumulated rockfill and road material. There was no substantial increase in the number of significantly damaged culverts observed during the 2020 inspection when compared to last year. The following culverts were too damaged and obstructed to function properly: R-00A (2+550), PC-14 (4+260), unnamed culvert at 5+700, PC-1 (9+952) and PC-16 (54+950). If insufficient capacity to handle the flow is observed at locations where culverts are obstructed or damaged, it is recommended to clear the obstructions or repair the culvert.

The observations and descriptions for each culvert at the time of the inspection as well as recommendations can be found in Appendix D1. For example, for some culverts, it is recommended to monitor the water level upstream and the flow through the culvert during high flow events (e.g., freshet season). A photographic log of the culverts is included in Appendix D2.

6.2 Bridges

Nine bridges are located along the AWAR; four Acrow Panel bridges and five Rapid Span bridges. A structural and/or mechanical assessment of the bridges was not conducted and is beyond the scope of this geotechnical inspection. A description of the observations of the bridges made during the inspection is presented in Appendix D1. A photographic log of the bridges is included in Appendix D3.

The bridges have been identified in sequence, increasing in number along the road from Baker Lake to Meadowbank (e.g., from Bridge 1 to Bridge 9). The name of each bridge (e.g., R02) is consistent with the as-built drawings of the AWAR provided by AEM. Each bridge is also identified by its approximate kilometre location (e.g., km 8+750).

Due to the low-lying terrain between Baker Lake and Meadowbank, water flow typically occurs in broad areas and not in well-defined channels. The majority of water crossings spanned by bridges have increased channelization

of flow due to the embankment fill at the crossing location. No significant signs of embankment erosion were observed at the time of the inspection as they are generally constructed with coarse rockfill.

The bridges and their embankments were in good geotechnical condition at the time of the inspection. Signs of settlement were observed at Bridge R-15 and this condition should continue to be monitored. The following observations were made for each bridge during the inspection and are listed in Appendix D1:

- **Bridge R02 at about km 8+750**: Normal flow was observed at the time of the inspection. No signs of erosion or turbidity were noted. Both abutments show deformation of the corrugated steel bins under the weight of the bridge. In 2011, two additional culverts of 1,800 mm in diameter were installed nearby to increase the drainage capacity during high flow events and prevent the road and the bridge from washing out. It is understood that AEM removes snow and ice at this location and other bridges before the freshet and will continue this practice in the future.
- **Bridge R05 at about km 17+600**: Minor damage to the bin wall of both abutments was observed; it is likely a result of past snow removal activities. No reparation is required yet. No evidence of erosion was observed, and the foundation was in good condition. The streambed consists primarily of cobbles, gravel, and a few boulders towards the perimeter of the channel.
- **Bridge R06 at about km 23+100**: Construction of the bridge has concentrated flow in this area. No signs of erosion or turbidity were observed, and the bridge was in good condition at the time of the inspection.
- **Bridge R09 at approximately km 48+500**: Construction of the bridge has concentrated flow in this area. No signs of turbidity or erosion were observed at the time of the inspection and the bridge was in good condition. Small tension cracks are visible on the top of the southwest abutment. They seem inactive and healing but should continue to be monitored.
- **Bridge R13 at about km 62+060**: At the time of the inspection, the bridge was in good general condition. No signs of turbidity or erosion were observed. In 2018, the side of the north abutment seemed inclined; In 2019, the bridge appeared horizontal, it is not known if it has been repaired. The first railings pile on the northwest side is partly ripped.
- **Bridge R15 at about km 69+200**: Signs of settlement were observed as the bridge was dipping toward the western side on both abutments. The bridge foundation did not show any signs of adverse conditions but is slowly settling. No remediation work is recommended for the moment, but the situation should be monitored. Minor damage to the bin wall of both abutments was also observed and is likely a result of past snow removal activities. No evidence of erosion or turbidity was observed.
- **Bridge R16 at about km 73+800**: No signs of erosion or turbidity noted, despite some flow beneath the north abutment. Construction of the bridge has concentrated the flow in this area.
- **Bridge R18 at about km 79+500**: The bridge is generally in good condition. The middle steel panel on the bridge deck is broken and bent. A boulder field is located beneath the bridge and no flow was observed at the time of the inspection.
- **Bridge R19 at about km 83+150**: Steel plates with pipe anchors are installed along both embankments of the bridge. Some damage (bending) to the steel containment plates was observed, which may be associated with snow removal activities. The damage is minor and does not impact the geotechnical integrity of the bridge or of the embankment as the surrounding pipes seem to hold the metal sheet in place (protecting the

abutment backfill). Small tension cracks are visible on the top of both sides of the north abutment. They seem inactive and healing but should continue to be monitored. No turbidity or erosion was observed at the time of the inspection.

7.0 WHALE TAIL PROJECT ROAD

The Whale Tail Project Road was built between 2016 and 2019 to connect the Meadowbank Mine site to the Whale Tail Project site under development. The road is 64 km long with eight bridge crossings and culverts installed at a total of 290 locations. Each structure along Whale Tail Project Road, their designated name, their approximate location and the observations noted during the inspection is provided in Appendix E1.

The road design is based on a general rockfill from quarries or sand and gravel from esker burrow pit sub-base and crushed granular rockfill surfacing with a combined minimum thickness of 1.0 m over thawed stable soil and 1.2 m over thawed susceptible soil.

The surface of the road at the time of the inspection was in general good conditions, except in the section north of km 174:

- The road material, constituted of fine esker-like material, was observed to be eroded on the shoulders and side slopes by run-off water, especially at km 174 and 177. The center of the road is still in good condition and no immediate safety hazard was identified for vehicles.
- Settlement of the east shoulder was observed at km 176.5. Ponding water present at the toe of the slope may have contributed to foundation degradation.

No other sign of thermal degradation of the permafrost was observed on the road during the inspection. It should be noted that as with the AWAR, signs of thermal degradation may not necessarily be observed in the future due to the regular road maintenance performed by AEM. During the inspection, water levels and flow velocities at the crossings were normal for the time of year.

Fill material that comprises the majority of the road provides no significant barrier to low gradient water flow due to its coarse nature. During higher flow and runoff periods, water may flow through portions of the road fill. Water was observed flowing through the rockfill near some culverts during the inspection, and signs that water flowed beneath the road were observed at some locations during the inspection. This could also be due to the inlet or the outlet of some culverts having been installed too high or too low, which did not promote the flow of water through the culvert until a certain water level had been reached.

As with the AWAR, AEM is conducting regular and event-based visual inspections during the year of the fish-bearing water crossing locations along the access road. This data is compiled by AEM to confirm the hydraulic function of the crossings, the adequacy of the crossing locations with respect to the watercourses, and minimal impact to fish habitat.

It is understood that AEM's monitoring program includes an assessment of sedimentation and potential erosion issues at the major bridge crossings. Consideration should be given to expanding AEM's monitoring program to include all culverts and bridges along the road to assess if they are providing adequate capacity during the freshet and following large precipitation events.

It is recommended to repair the eroded sections of the road, to be on the watch for further signs of erosion along the high sandy side slopes along the road and to backfill potential erosion at the toe of bridges as soon as it is noticed.

7.1 Culverts

All culverts with a diameter larger than 900 mm were thoroughly inspected. Smaller diameter culverts were checked from the road surface. Culverts not observed should be considered possibly buried.

The culverts were generally in good condition at the time of the inspection. Most culverts were unobstructed with no signs of erosion and no signs of damage to the culverts. Culverts observed to be buried last year were mostly still buried.

Many culverts seem to have been installed rather high, depending on the permeability of the road to freshet flow, thus possibly posing a risk of road washout. The worst condition would be a continuous boulder field under the sand and gravel road foundation without a rockfill layer at the base of the road.

A photographic log of the inspected culverts is provided in Appendix E2. Given that culverts are almost all in good condition, only locations where important observations were made are documented in the photographic log. Culverts in the following discussion, and in the photographic log, have been identified by their identification number to be consistent with those indicated on the list provided by AEM. Each culvert is also identified by its approximate kilometre location (e.g., km 132+324) along the road alignment, starting at Vault Pit.

No signs of erosion were observed during the inspection.

During the inspection, signs of water flowing beneath the road were observed at some locations. This is generally due to the inlet and the outlet of the culvert having been installed high above original natural ground surface, which does not promote the flow of water through the culvert until a certain water level has been reached. This condition can promote erosion and risk of washout beneath the road and should be monitored. The progression of the situation should be monitored at freshet.

Obstructed and damaged culverts were observed at some locations during the inspection. In many cases, the obstructions are related to inlets and/or outlets becoming partially or completely obstructed by accumulated rockfill and road material or blocks. The following culverts were completely obstructed at a least one of the extremities: #5 (117+525), #7 (118+013), #7-2 (118+016), #13 (120+615), #27-2 (123+300), #45 (125+710), #48 (127+203), #54 (128+388), #55 (128+440), #64 (129+920), #65 (130+924), #83 (136+300), #85 (136+671), #86 (136+740), #88 (136+861), #89 (137+180), #93 (138+100), #97 (138+436), #98 (138+482), #101 (139+025), #105 (140+555), #112 (142+630), #113 (142+736), #115 (142+865), #116 (142+940), #117 (143+173), #118 (143+433), #133 (148+141), #150 (152+171 to 152+179), #151 (152+562), #160 (155+966), #163 (156+474), #192 (163+190), #234 (170+385), #241 (171+235), #268 (175+774), #278 (177+870), #283 (178+965), #284-2 (179+072). If insufficient capacity to handle the flow is observed at locations where culverts are obstructed or damaged, it is recommended to clear the obstructions or repair the culvert. The #47 set, previously damaged, now appears to be in good condition. It is still recommended to monitor culverts #167 (41+843) and #232 (53+928), where there are signs of water flowing below the culverts.

The observations and descriptions for each culvert at the time of the inspection as well as recommendations are provided in Appendix E1. For example, for some culverts it is recommended to monitor the water level upstream and the flow through the culverts during high flow events (e.g., freshet season).

7.2 Bridges

Eight bridges are located along Whale Tail Project Road. A structural and/or mechanical assessment of the bridges was not conducted and is beyond the scope of this geotechnical inspection. A description of the observations of the bridges made during the inspection is presented in Appendix E1. A photographic log of the bridges is included in Appendix E3.

The bridges have been identified by their approximate kilometre location (e.g., km 132+000) along the road alignment, starting at Vault Pit.

Due to the low-lying terrain between Meadowbank and the Whale Tail Project site, water flow typically occurs in broad areas and not in well-defined channels. The majority of water crossings spanned by bridges have increased channelization of flow due to the embankment fill at the crossing location. No significant signs of embankment erosion were observed at the time of the inspection as they are generally constructed with coarse rockfill.

The bridges and their embankments were in good geotechnical condition at the time of the inspection. No signs of erosion or turbidity were observed. The crack present on the north-west concrete abutment of bridge 160.8 (160+800) appears stable since it was first observed in 2019.

8.0 QUARRIES AND ESKERS

8.1 Quarries along the All-Weather Access Road

Twenty-two quarries were developed in the past along the AWAR to provide material for its construction. An additional quarry was developed near the airstrip at Meadowbank to provide further construction materials. All quarries were inspected as part of the geotechnical inspection. A summary of the observations and recommendations made during the 2020 inspection for the structures along the AWAR road including the quarries is provided in Appendix E1. In accordance with the as-built drawings, the quarries have been numbered sequentially from 1 to 22 starting near Baker Lake and increasing towards Meadowbank. The airstrip quarry is referred to as Quarry 23 and is used to store miscellaneous items such as drill core on racks, diamond drill contractor drill rigs, seacan containers, pipes, and culverts.

The closure and reclamation plan requires that all quarries and borrow sources developed during the construction of the AWAR be reclaimed following their use. The closure plan further requires that all quarry slopes be left at an angle of 45 to 50 degrees. During the inspection, it was observed that slope remediation was partly completed but none of them were totally reclaimed. Most quarries are clean although some walls need scaling. Most quarry walls were also free of loose blocks and granular material. Loose blocks and granular material had been placed at the toe of the walls. At the time of the inspection, most of the quarries were dry.

During the inspection, it was observed that Quarries 4 and 14 were flooded. These quarries have been flooded for a couple of years and it is understood that AEM is evaluating how to eliminate the ponding of water within these quarries. Quarries 5, 15 and 23 contained minor accumulations of water. Quarries that contain significant amounts of ponded water should be monitored to assess if ponding persists and, if necessary, whether ditches should be developed to facilitate the drainage of water.

Unstable blocks and loose rocks along steep walls remain in Quarries 3, 7, 9, 10, 16 and 23. The west wall of Quarry 3 also contains a falcon nest that prevents its maintenance. It is recommended that workers be cautious in these quarries, be aware of the potential hazard, and stay at a minimum 20 m distance of the walls.

Quarry 18 has a high wall (south wall) with unstable blocks. Blasting operations were recently conducted in this quarry and a pile of blasted material was present in front of the south wall.

A photographic log of the quarries along the AWAR is included in Appendix F.

8.2 Eskers and quarries along Whale Tail Project Road

Seven eskers and five rock quarries were developed along Whale Tail Project Road to provide material for its construction. All of them except Eskers #2, #3, #4 and #5A are still active. All eskers and quarries were inspected as part of the geotechnical inspection. A summary of the observations and recommendations made during the 2020 inspection for the structures along Whale Tail Project Road, including the eskers and quarries is presented in Appendix E1. In accordance with the as-built drawings, eskers have been numbered sequentially from 1 to 6 starting at Meadowbank and increasing towards the Whale Tail Project site. The quarries are not numbered and were identified for the inspection by their approximate location along Whale Tail Project Road.

The closure and reclamation plan requires that all quarries and borrow sources developed during the construction of Whale Tail Project Road be reclaimed following their use. The closure plan further requires that all quarry slopes be left at an angle of 45 to 50 degrees. At the time of the inspection, all of the quarries and eskers were dry, except esker #2 and rock quarry 168, which contained a small accumulation of water.

Unstable loose rocks along steep walls and unstable soil slopes were observed in all eskers and quarries, except Esker #3, #5 and #6. It is recommended that workers be cautious in these locations and are aware of the potential rockfall hazard.

9.0 BULK FUEL STORAGE FACILITIES

This section contains the observations made during the 2020 annual inspection of the Baker Lake, Meadowbank and Whale Tail Project tank farm facilities (Main Camp only, since the Vault fuel storage facility no longer exists).

9.1 Baker Lake Tank Farm

The Baker Lake tank farm consists of seven large-capacity tanks (10 million litres each) and twenty Jet A fuel tanks (100,000 litres each) that were constructed within five bermed areas (containment cells). Tanks 1 and 2 are located within the first containment area, which is located on the western side of the fuelling area. Tanks 3 and 4 are located within a second containment area adjacent to the first. A central berm is located between the two containment areas. Tanks 5 and 6 are within the third containment area located north and upslope of Tanks 3 and 4. Tanks 5 and 6 are situated within an entirely separate containment cell sub-excavated into the hill slope above the initial tank farm area. Tank 7, built in the winter of 2020, is located within a new containment area built north and upslope of Tanks 5 and 6. Twenty Jet A Fuel tanks were installed in 2013 in a containment area located northwest of Tanks 5 and 6 lying over a 0.5 m-thick granular base fill material.

Each containment area has been lined with a 1.5-mm high density polyethylene (HDPE) geomembrane to provide secondary containment, except the Jet-A fuel tanks area which are lined with a bituminous geomembrane.

Visual inspection of the majority of the liner in the containment areas for Tanks 1 to 6 was not possible as it is covered with granular fill material to provide protection. The granular fill material protecting the geomembrane was eroded due to wave actions in some areas, exposing the geomembrane. This condition was observed all along the south side of Tanks 3 and 4 and on the north and west sides of Tank 1. A section of exposed geomembrane

with a fold was observed at the northeastern corner of Tank 4. The hole in the exposed geomembrane (300 mm diameter hole) previously observed on the south southwestern corner of Tank 3 at the toe of the slope had been repaired. It is also recommended to cover the exposed area with geotextile and fill material to re-establish the liner protection.

Animal burrows were observed on the south side of Tanks 3 and 4. It is recommended to assess whether the geosynthetics have been damaged. AEM expressed concern about possible damage to the geomembrane during removal of the granular cover. Golder considers that this verification should still be performed at least once to ensure that the reoccurring burrows are not causing damage to the geomembrane. This verification should be documented to allow for resolution of this recommendation.

Ponded water was observed on the southern side of all containment areas except the new one around Tank 7. Water ponding in these areas has been observed over the years, however the amount of water ponding is lower in 2020 than in 2019. No sump or pump was visible during the site visit. It is recommended to keep the water accumulation at a minimum near the tank foundation. Signs of high-water levels being present in this area in the past were noted during the inspection.

The geomembrane of the containment cell of the 20 Jet A fuel tanks remains uncovered around the tanks. A hole in the liner (100 mm wide) was observed on the southwest corner of the containment area. The hole in the geomembrane should be repaired to ensure a good performance of the retention basin. Water was observed ponding on the northern and southwestern side of that containment cell. It is recommended to remove the accumulation of water before it freezes to avoid damaging the geomembrane of the containment cell by ice accumulation. The bituminous geomembrane no longer shows signs of melting. The melting of the bitumen occurred in the past may have damaged it in such a way that contaminated water could seep into the environment.

The embankments around the first and second tank farm containment areas were stable. The northern slope of the containment area of Tanks 5 and 6 are steep and the sand and gravel cover may be prone to erosion. In the area where liner protection was repaired last year on the northern side of Tank 5, tension cracks parallel to the slope (10 to 30 mm wide) and signs of settlement (about 50 to 100 m) were observed in the fine filter surface on top of the slope and on the crest. The area should be monitored and repaired if needed to re-establish liner protection.

The fuelling station on the western side of the tank farm consists of two containers and a pumping system. The fuelling area is covered by granular road base material. The fuelling station was in good geotechnical condition.

A photographic log of the Baker Lake tank farm and a plan view that shows the location of the photos and observations are included in Appendix G1.

9.2 Meadowbank Tank Farm (Main Camp)

The Meadowbank Main Camp tank farm consists of a single large-capacity tank (5.6 million litres) constructed within an area that has been sub-excavated to provide secondary containment. The area has been lined with a 1.5-mm HDPE geomembrane.

At the time of the inspection, the tank backfill foundation pad was in good condition. The liner was well covered with granular fill material for protection.

Water (approximately 50 mm) was observed ponding within the eastern corner, as in previous years. Signs of high-water levels being present in this area in the past were noted during the inspection. Pumping of ponded water is considered a good practice and should resume.

A fuelling station is located on the northern side of the tank farm. The fuelling area is covered by granular road base material and a geomembrane liner is installed below the refuelling area.

As the tank farm area has been sub-excavated, runoff from the tank farm is not anticipated to occur. The side slopes in the tank area are shallow and appear stable.

A photographic log and a plan view that shows the location of the photos and observations noted at the Meadowbank tank farm is provided in Appendix G2.

9.3 Whale Tail Project Tank Farm

The permanent Whale Tail Project tank farm is located north of the main camp. The temporary tank farm has now been dismantled.

The Whale Tail Project tank farm was fully operational at the time of the inspection. At the time of the inspection, the tank farm was in good condition. No sign of instability was observed during the inspection. The tension crack observed in 2019 was no longer visible. The use of bituminous geomembrane, as with the other tanks farms, can be environmentally problematic in case of jet fuel spill that could melt the material and cause a breach in the containment system.

Some water was observed ponding within the embankment on the southern and eastern sides of the tank, mixed with an oily substance in the southwestern corner.

A photographic log is contained in Appendix G3.

10.0 OTHER MEADOWBANK FACILITIES

This section contains the observations made for the other Meadowbank facilities visited during the 2020 geotechnical inspection such as site roads, the diversion ditch and erosion protection structure, the RSF till plug, the landfill, the contaminated soil storage and bioremedial landfarm facility, the Stormwater Management Pond, the airstrip and the crusher retaining wall. Figure H1 shows the location of the photos taken during the inspection for the other Meadowbank facilities.

10.1 Site Roads

The following roads were inspected:

- East Road – Former haul road between North Portage Pit and East Dike.
- West Road – Haul road between North Portage Pit and the plant.
- Vault Road – Haul road between North Portage Pit and the Vault deposit.
- RF1 – Starts near the northern abutment of Stormwater Dike and follows the eastern perimeter of the TSF's North Cell and the southwestern side of the Portage Rock Storage Facility.
- RF2 – Starts at the end of RF1 and follows the western side of the Portage Rock Storage Facility.

10.1.1 Field observations during inspection

These roads were of adequate width and had appropriate berms at the time of the inspection. The haul road from Goose Pit to the plant was not inspected during this investigation. No geotechnical concerns were identified with East Road, West Road, RF1, and RF2.

Three culverts are installed beneath Vault Road at coordinates 640 964 E / 7 217 466 N. They were slightly collapsed in the middle and showed signs of erosion at the inlet. This condition has been observed since 2012. No action is required as their condition is stable. These culverts need to be monitored during freshet to ensure that they provide sufficient capacity, and that erosion is not occurring. Two other culverts are located at 639 214 E / 7 216 189 N on Vault Road. These culverts are in good condition even though water flows below the culverts on the NP1 Lake side. It is recommended to observe this area at freshet and to clear the obstructions if insufficient capacity to handle the flow is observed.

Temporary roads developed for construction purposes were not inspected.

Photographs of the Vault Road culverts are provided in Appendix H1.

10.1.2 Geotechnical instrumentation data review

Four (4) thermistors were installed to monitor the temperature of RF1 and RF2 (which delineates the northeastern side of the TSF North Cell), as detailed in Appendix I (Table 11). Plots of their data are presented in Appendix C.

Three thermistors are installed on RF1 (T121-1, T73-6, and RF1-3). Thermistor T121-1 shows frozen conditions all year long with temperatures varying from -0.7°C to -5.4°C. Thermistor T73-6 shows sub-zero temperatures below El. 149.5 m, corresponding to the tailings, and the presence of an active layer above that elevation. RF1-3 shows frozen conditions all year long below El. 147.5 m with temperatures varying between 0°C and -15°C, and an active layer above that elevation.

One thermistor is installed on RF2 (T122-1) and shows temperatures that vary from -1.7°C to -6.6°C, indicating that the RF2 foundation is in a permafrost state.

10.2 Diversion Ditches and Sediment and Erosion Protection Structure

A retention basin and a series of diversion ditches (Western and Eastern) surround the catchment basin of the North Cell. These structures are designed to convey surface water runoff away from the TSF.

Since 2014, the Western Diversion Ditch has been directing the water to a retention basin, which is then pumped to the North Cell due to a turbidity problem caused by the erosion of the ditches. Rehabilitation work was done in 2016 to address the situation. The Eastern Diversion Ditch discharges to lake NP-2, then lake NP-1 and then to Dog Leg Lake. Sediment barriers and erosion protection structures are installed at the outlet of the diversion ditch in Lake NP-1, Lake NP-2 and Third Portage Lake (Dog Leg Lake).

During the inspection, it was observed that the diversion ditches around the TSF western and eastern extensions were in good condition. The erosion protection structure and sediment barriers were also in good condition at the time of the inspection. It is important that they be inspected during to the freshet season as snow melts away and

allows visual assessment. The Western Diversion Ditch will need to be amended for closure in order to drain the accumulation of water in its northern part.

Photographs of the diversion ditch and its sediment and erosion protection structure are provided in Appendix H2.

10.3 RSF Till Plug

The RSF till plug (till plug) is located on the upstream side of the Diversion ditches access road between the Portage Rock Storage Facility (RSF) and lake NP2. The till plug is a zoned low permeability earth fill structure intended to prevent seepage from the RSF to reach lake NP2 and to facilitate seepage collection on the upstream side.

The till plug was constructed in the summer of 2013. Its construction consisted in a layer of till with 1 m minimum thickness placed on a foundation excavated to permafrost, which was then covered by 1 m of fine ultramafic rockfill. The materials were compacted with an excavator bucket.

No sign of erosion or geotechnical issues were identified with this structure during the inspection. A pump equipped with an automatic switch was installed within the pond contained by the plug to redirect the water to the North Cell. As the chemical monitoring in NP2 has not shown any signs of contamination for the last years, the performance of the till plug is considered adequate.

Appendix H3 contains photographs of the till plug.

10.4 Landfill

The Meadowbank landfill is located on the northeastern side of the TSF, within the Portage RSF area. It is being progressively constructed and filled. Waste material is being dumped within a bermed area on a pad built using waste rock from the open pit. The waste is then covered with a thin layer of rockfill to reduce windblown debris. No geotechnical concerns were identified with the landfill. However, the volume of the landfill has increased compared to previous years due to the lack of rockfill production since the pits are now inactive. Photographs of the landfill are provided in Appendix H4.

10.5 Contaminated Soil Storage and Bioremedial Landfarm Facility

The Meadowbank Contaminated Soil Storage and Bioremedial Landfarm Facility is currently located north of Central Dike, within the South Cell. A 1 m thick till pad has been placed for the landfarm foundation. A berm surrounds the landfarm to contain the fluid/runoff and stops it from moving laterally. Contaminated soils are stored within this cell to promote biodegradation until the soil meets environmental criteria before being disposed within the Portage Rock Storage Facility.

The active area lies over a natural steep slope covered by rockfill as a pad made to operate the landfarm. The west slope of the rockfill pad is at its angle of repose (seemingly 1.1 to 1.3H:1V). This rockfill was probably placed without neither lifts nor compaction and extends into the South Cell pond. The slope is considered at risk for high deformation to slope failure. The signs of superficial slope failure observed in 2018 had almost disappeared and no sign of instability is observed anymore. It is recommended to keep this area on watch for further development. If signs of instability are developing again inside the pile, a thorough assessment and mitigation measures should be put in place.

Photographs of the Contaminated Soil Storage and Bioremedial Landfarm Facility are provided in Appendix H5.

10.6 Stormwater Management Pond

The Stormwater Management Pond is located near the main camp and is being used to store various site waters and sewage. No runoff from the pond was observed at the time of the inspection. No geotechnical concerns were identified with Stormwater Management Pond and the nearby crusher ramp. At the time of the inspection, due to a high water level, Stormwater Management Pond was pumped out into the South Cell. Due to the proximity of the crusher ramp to the pond, it is recommended that regular geotechnical inspections of the crusher ramp be conducted. The surface of the ramp was not inspected on safety grounds.

10.7 Airstrip

There are several small channels dug adjacent to the airstrip to divert water into small excavations or “ponds.” The channels and ponds are unlined, and the ponds have no designed outlet structure. In general, these ponds serve to collect water and allow suspended sediments to settle out before the water overflows into other vegetated areas and/or infiltrates them, depending on the thermal state of the soils.

The runway was built to allow a Boeing 737-200 to land at the Meadowbank site. The northwestern boundary of the airstrip extends approximately 20 m within the lake and was constructed in two phases. Rockfill was placed 1.0 m above water during Phase 1 and the rockfill was constructed to its final elevation during Phase 2. The rockfill slopes for Phase 2 have a side slope of 1.5H:1.0V. The rockfill of Phase 2 is surrounded by a 17.0 m wide bench going from the toe of Phase 2 to the edge of the crest of Phase 1. The Phase 1 rockfill surface and visible side slope were built with coarse boulders to protect the embankment against waves and ice action. The airstrip construction within the lake is considered appropriate.

The slopes were profiled along a portion of the airstrip to a 3H:1V slope to prevent settlement.

No geotechnical concerns were identified with this structure during the inspection.

10.8 Crusher Retaining Wall

No geotechnical concerns were identified with this structure during the inspection. A photographic log of the crusher retaining wall is provided in Appendix H6.

11.0 OTHER WHALE TAIL PROJECT FACILITIES

11.1 Attenuation Pond and Ramp

The attenuation pond is located within the former footprint of Whale Tail North Pond which was dewatered for the development of the Whale Tail Pit. It receives contact water pumped over the Whale Tail Project site, and its water is treated by the water treatment plant for environmental discharge in Whale Tail South Lake or Mammoth Lake.

A ramp and a pump pad were constructed to install the reclaim pump that transfers water form the attenuation pond to the water treatment plant. The primary ramp was built in winter with run-of-mine NAG rockfill on the frozen foundation. Due to thaw-induced settlement and space required for piping lines, the ramp was rebuilt and widened in the summer of 2019. A secondary ramp, also built with rockfill, goes to the pump pad from the ring road south of the pit.

No geotechnical concerns were identified with this structure during the inspection. The discharge points of contact water into the Attenuation pond are located directly on the lakebed sediments, which are eroded where the water flows down to the pond (channeling). This does not pose any geotechnical hazard but increases the turbidity in the reclaim water.

Photographs of the attenuation pond and ramp are provided in Appendix H7.

11.2 Mammoth Lake Diffuser

Three diffusers are installed in Mammoth Lake for discharge of non-contact and treated water into the environment. They were reinstalled in 2019 after the first diffuser did not sink properly onto the lake bottom. The diffusers appear to be well installed and functioning normally.

Additional diffusers are in the process of being installed in Whale Tail South Lake and should be inspected next year.

Photographs of the Mammoth Lake diffuser are provided in Appendix H8.

11.3 South Whale Tail Channel

The South Whale Tail Channel (SWTC) is built between Whale Tail South Lake and Mammoth Lake and convey water from WTS to Mammoth Lake. Its purpose is to limit the water level in WTS to reduce the hydraulic head at WTD. The SWTC inlet elevation at WTS is 155.37 m and it is built with a fan shape to reduce risks of blockage by ice or debris. The channel is excavated in the natural ground and covered in granular transition layers, a geotextile, and riprap. Figure C5 shows a plan view of the SWTC.

No geotechnical concerns were identified with this structure during the inspection. A small ridge of riprap material was observed in the inlet, but water was flowing in the SWTC. It is recommended to clean that excess of material to ensure the capacity of the channel. AEM proceeded to that remediation after the site visit. Turbidity barriers were in place at the outlet in Mammoth Lake. Settlement in the adjacent Road 24 (see Section 11.6) did not impact the SWTC.

Photographs of the South Whale Tail Channel are provided in Appendix H9.

11.4 Saline Ditch

The Saline Ditch is a water collection ditch built in the periphery of the Underground Waste Rock Storage Facility, located northeast of the Whale Tail Pit. Due to the underground operations in permafrost, large quantities of calcium chloride are used and retained in the waste rock. The purpose of the Saline Ditch is to collect saline water runoff from the facility, and to redirect it by gravity into the AP5 quarry for recirculation. Figure C6 shows a plan view of the Saline Ditch.

During inspection, the Saline Ditch was observed to be mostly in good condition. Some large rocks (about 300 mm) were present in the ditch at approximately Sta. 0+130 and should be removed to ensure the ditch capacity in the event of a flood. Tension cracks were observed on top of the northern slope of the ditch between Sta. 0+580 and 0+620 but appear inactive and healing. The outlet of the ditch towards the AP5 quarry, constituted of a culvert beneath the road, was obstructed at its outlet and water was ponding at its inlet and in the southwestern extremity of the Saline Ditch. It is recommended to clear this culvert.

Photographs of the Saline Ditch are provided in Appendix H10.

11.5 Sumps and Non-Contact Water Management Infrastructures

A number of water collection sumps and non-contact water pumping stations are present on the Whale Tail Project site. No geotechnical concern was observed with these structures. Water that meets environmental quality criteria is discharged into Mammoth Lake, otherwise it is collected in the attenuation pond and treated before discharge.

A seepage interception system composed of a series of four (4) pumping stations (P1 to P4) is present at the downstream toe of WTD. Its purpose is to collect the seepage water and redirect it to the attenuation pond to limit water flowing through the foundation and delaying freeze-back, as well as providing a real-time monitoring of the visible seepage rate. Each pumping station is composed of a vertical culvert embedded in the foundation and equipped with an electrical pump, encased in a seacan. The system was commissioned in the spring of 2020 and built in the winter of 2020. The sandy material which the seacans are installed on has settled and eroded at stations P1, P3 and P4. No damage to the stations themselves has been observed so far, however it is recommended to repair the seacan foundations with non-erodible material such as rockfill. It is also recommended to amend the collecting basin of stations P4 and P3 to ensure that all the streams that are currently bypassing the pumping system are intercepted. AEM conducted that adjustment after the site visit.

11.6 Site Roads

Site roads and culverts at the Whale Tail Project Site were mostly in good condition during inspection. These roads were of adequate width and had appropriate berms at the time of the inspection. On Road 22 near the Mammoth Lake diffuser, water was observed ponding in the southern side of the road and signs of erosion on the road surface indicate that water overflows the road at this location. A culvert should be installed beneath the road to avoid erosion issues. Road 24, along the South Whale Tail Channel, shows large settlement and tension cracks. This is likely due to the ice-rich foundation thawing, as this road was built in winter with minimal foundation preparation. It is recommended to repair the road to re-establish the rolling surface. Road 25, that goes around the Whale Tail WRSF, was in good condition despite a rough surface. It is recommended to add granular material to the road surface and to grade it.

The haul roads around the ore stockpile were not inspected for safety reasons. Temporary roads developed for construction and dewatering purposes were not inspected.

Photographs of the Whale Tail Project site roads are provided in Appendix H11.

12.0 SUMMARY AND RECOMMENDATIONS

The following table presents a summary of the key findings and recommendations of the 2020 geotechnical inspection, as well as evolution observed compared to the previous inspection. General recommendations that do not require a specific action are not reiterated in the table for clarity purposes.

Table 2: Summary of Recommendations and Priority Levels from the 2020 Geotechnical Inspection

Year of Recommendation	Priority Level[1]	Recommended Action	Follow up the years after
Meadowbank dewatering dikes			
2018	P-4	■ Regular monitoring and assessment of the monitoring data in the dikes (piezometric, flow, thermal, inclinometer, and seismograph including monitoring to control the reaction to blasting around Pit E5) should continue. It is recommended to flag the piezometers that recorded data below 0°C in the past and be very careful when interpreting their data as they might be broken. Once a piezometer has frozen, it cannot be relied upon even if it thaws.	■ Still the case in 2020.
South Camp Dike			
2019	P-3	■ Some water was ponding on the downstream side of South Camp Dike. No flow was observed. This is likely due to run-off water as there were unusually high precipitations in 2019. The water accumulation should still be monitored to confirm this.	■ **Resolved in 2020:** with the drier season, very little water is ponding at the downstream toe. Not a concern.
Bay-Goose Dike			
2018	P-4	■ Water ponds were observed at the downstream toe during the inspection, similar to the previous inspection. It is recommended to pump them periodically to allow for good visual inspection of the downstream toe if visibility is impaired by the presence of the pond. The pond flow formed by seepage should continue to be monitored and recorded, **no additional action to take**.	■ Still the case in 2020. Appropriate monitoring is performed.
2018	P-4	■ Limited evidence of seepage is observed at the downstream toe of the North Channel, Channel 1 and Channel 3. The instrumentation data and field observations seem to indicate that seepage occurs at these locations but reports directly to the Pits instead of the downstream toe area. To continue monitoring, **no additional action to take.**	■ Seepage ongoing.
2018	P-3	■ The piezometers in the North Channel show a pressure build-up with the drilling operations associated with the freezing of the nearby pit wall, which needs to be closely monitored to verify the interpretation of the freeze-back. The designer must be advised in the event of significant variations leading to a TARP level change, in accordance with the OMS manual.	■ Still the case in 2020 even without drilling operations. ■ Pressures are on a slow rise, to be monitored.
2019	P-4	■ Seepage rates observed in the channels have increased compared to the last years and the decreasing trend. The increase may be	■ **Resolved in 2020:** seepage rates back to normal trend and are acceptable.

Table 2: Summary of Recommendations and Priority Levels from the 2020 Geotechnical Inspection

Year of Recommendation	Priority Level(1)	Recommended Action	Follow up the years after
		due to high amount of precipitation the site received this year. To be monitored for evolution.	
2019	P-3	■ Assess the validity of the current instruments layout for monitoring of the dike's performance over an extended operation time (10 more years due to in-pit deposition). Install additional instruments if necessary.	■ Resolved in 2020: review of the available instrumentation and its spatial distribution shows that coverage is still adequate.
2020	P-4	■ The general trend in the piezometric readings has been steadily increasing since 2018 and the increase seems to accelerate and should continue to be monitored. **No additional action needed.**	■ Still the case in 2020. Appropriate monitoring is performed.
East Dike			
2019	P-3	■ VWP-400-C and VWP-420-C show a seasonal trend that is rising through the years since 2015 and doubled yearly over the last two years. Total head is now rising close to 2 m in 2019 from those two VWPs., while temperature is cooling. It is recommended to further investigate this behaviour (planned by AEM) and closely follow the significant seasonal trends in the future to react quickly if need be. Based on those aspects, it is considered that those observations should have triggered a yellow threshold criterion per the Dewatering Dykes OMS manual (yellow - personal notification and action required).	■ Behaviour investigated and likely linked to freeze-back of the surrounding area. ■ Still visible in 2020, to keep monitoring.
2019	P-4	■ The general trend in the piezometric readings has been steadily increasing since 2014 and the increase seems to accelerate in 2019 and should be monitored.	■ Still the case in 2020
Whale Tail Project dewatering and water management dikes			
Whale Tail Dike			
2020	P-3	■ Continue monitoring the seepage at the downstream toe of the dike, both by measuring the flow rates and observing areas of visible seepage. Instruments showing a possible shift in seepage locations at the abutments (0+142, 0+750) must be closely monitored and the data correlated with field inspections according to the OMS frequency,	
2020	P-3	■ Monitor unusual instrumentation data trend:	

Table 2: Summary of Recommendations and Priority Levels from the 2020 Geotechnical Inspection

Year of Recommendation	Priority Level[(1)]	Recommended Action	Follow up the years after
		▪ PZ 0+260 P1C: rapid increase in pressure (+0.7 m) at the end of August 2020 which is not completely dissipated yet. To monitor and investigate if the trend continues. ▪ INC-0+560: a rapid warmup within the wall between El. 152 and 155 m in summer 2020, looking like a seepage signature. To investigate with surrounding instruments and field observations.	
WRSF Dike			
2020	P-3	■ The instrumentation data seems to indicate that the thermal berm is performing as intended and is promoting freeze-back of the foundation. Since the seepage mechanism is still not well understood, it is important to keep monitoring the performance of WRSF Dike and be ready for seepage management by pumping of the upstream pond if it is observed again.	
Tailings storage facilities			
Saddle Dam 2			
2018	P-4	■ Water was observed on the downstream side ponding within the rockfill embankment between Sta. 20+275 and Sta. 20+475 and should be monitored. The water originates from run-off as proved by water sampling and testing.	■ Still the case in 2020. Continue water quality monitoring.
Stormwater Dike			
2018	P-4	■ In April 2018, oblique tension cracks (up to 5 cm wide) were observed similar to the previous years. The cracks have been filled with bentonite after stabilization in the summer of 2018. The evolution of the zone should be monitored. In case of new cracks, measures indicated in the OMS manual should be implemented.	■ 2020: no new sign of deformation was observed.
2018	P-4	■ An assessment should be conducted as to whether the design criteria will still be met with a different final tailings elevation on both sides of the dike. This can be done by the EoR but needs to be reviewed by the designer engineer. Tailings surface differential elevation could also impact the seepage flow which may impact also the thermal regime and affect the cells freeze back	■ Still the case in 2020: no development on this aspect.
2020	P-4	■ Monitor the piezometers PZ-SWD-03-A and B as they are starting to show large and unexplained variations in the pressure readings.	

Table 2: Summary of Recommendations and Priority Levels from the 2020 Geotechnical Inspection

Year of Recommendation	Priority Level[1]	Recommended Action	Follow up the years after
North Cell Internal Structure			
2018	P-3	■ The water is flowing well toward the west side of Stormwater Dike, where water is transferred into the South Cell. The early stages of the deposition seem satisfactory. The pumping stations on the downstream side of the dike are in place and working as needed. The capacity to store the inflow design flood must be verified during tailings deposition when updating the deposition plan.	■ 2020: tailings are no longer being deposited in the North Cell. Inflow design flood capacity should still be verified if deposition resumes for closure.
2019	P-2	■ Channelling of water has been observed at the upstream toe of the eastern part of the dike. The water flow has started to erode fine filter material at the toe. It is recommended to protect the filters in this area or to start capping this area as part of the closure plan.	■ Still the case in 2020. AEM is planning to cap the slope with rockfill in problematic areas.
2019	P-2	■ Tension cracks (2 to 5 m long, a few millimeters wide) have been observed during the inspection in the fine filter surface between Sta. 2+650 and 2+800 m, near the crest. They need to be monitored and repaired as they may decrease the efficiency of the filters in case of further tailings deposition.	■ Still the case in 2020 with a local failure (sloughing) of the fine filter layer. To be repaired to close the filter system. AEM was planning the remediation work at the time of the inspection.
2020	P-3	■ Deformation was observed in the upstream slope around Sta. 2+260, where the toe of the slope seems to have moved toward the upstream side of the dike. The filter system in this area is still expected to perform well, as no cracks or opening are present in the transition layers. To monitor for aggravation and possible repair needed.	
2020	P-2	■ Tension cracks (several meters long, 10 to 150 mm wide) have been observed during the inspection in the fine filter surface between Sta. 2+300 and 3+150 m, mostly located between the middle and the bottom of the upstream slope, with narrow cracks on the crest of the fine filter at Sta. 2+780. They need to be monitored and repaired as they may decrease the efficiency of the filters in case of further tailings deposition. It is recommended to protect the filters in the areas showing deformation or to start capping this area as part of the closure plan.	
2020	P-3	■ Linear erosion features were observed at several locations in the upstream surface, where the fine filter has started to wash out from the crest to the toe of the upstream toe. They were likely caused by important volumes of water draining from the crest during freshet,	

Table 2: Summary of Recommendations and Priority Levels from the 2020 Geotechnical Inspection

Year of Recommendation	Priority Level[(1)]	Recommended Action	Follow up the years after
		as no water discharge had been done in these areas. To monitor for aggravation and possible repair needed.	
Central Dike			
2018	P-3	■ Seepage from the South Cell is ponding on the downstream side of Central Dike. The water had an orange coloration with high turbidity, and AEM reported that these associated with rapid temperature variations were observed during most of the open water season in the previous years. The water level of the reclaim pond was temporarily lowered in autumn 2017 to reduce the hydraulic pressure on the seepage, and tailings deposition was amended to better cover the area between Saddle Dams 4 and 5. The mitigation measures resulted in a significantly decrease in the average flow. It is recommended to continue: 1. Maintaining a tailings beach against Central Dike; 2. Promote beach deposition to seal assumed fractured bedrock areas expected to control the seepage under Central Dike 3. Controlling the hydraulic gradient by proper management of South Cell water pond and dike downstream toe pond; 4. Closely monitoring the water quality; 5. Inspecting the structure for changing conditions.	■ Orange coloration was observed during the freshet of 2020, as usual. ■ Seepage is stable (110 m^3/h at the time of the inspection). ■ The South Cell has reached its full capacity and most water was pumped out of the cell. No more tailings deposition is planned in the South Cell at the moment. ■ Monitoring recommendations are still valid in 2020.

Table 2: Summary of Recommendations and Priority Levels from the 2020 Geotechnical Inspection

Year of Recommendation	Priority Level[1]	Recommended Action	Follow up the years after
2019	P-3	■ It is recommended to clean the angular granular material in direct contact with the LLDPE liner at approximately Sta. 0+750 m. A metallic piece around a pipe was also observed against the LLDPE liner at Sta. 1+000 m. This operation is required regularly and should be detailed in a procedure prepared by AEM. The procedure needs to be communicated to all concerned workers and added to the OMS manual. P-3 priority level instead of P-2 as the South Cell is inactive.	■ Partially resolved in 2020: the metallic object at Sta. 1+000 was removed. However, the granular material at Sta. 0+750 was still there, and a cable with a metallic plug is present at Sta. 0+900. All these items should be cleaned from the liner surface.
2019	P-3	■ Water was observed ponding along the LLDPE liner on the south side of Central Dike and Saddle Dam 5, from Sta. 0+850 m. It is recommended to remove this water before it freezes to protect the LLDPE liner. Recurring situation every year that is usually well managed by AEM.	
Saddle Dams 3, 4 and 5			
2018	P-4	■ During the inspection, water was observed ponding on the downstream side of Saddle Dam 3 and Saddle Dam 4. As the downstream toe is higher than the South Cell pond, this water does not come from the TSF. It is important to maintain the water level on the downstream side lower than the granular layer of the upstream toe liner tie-in granular material to prevent uplift of the geomembrane. As the elevation of the downstream side is lower than the elevation of the granular material, this should not be a problem if the downstream water level is managed. The management of this water could be simplified by the construction of a sump, as indicated in the construction drawings, to direct the water in a low point. This is the case for Saddle Dam 3.	■ Still the case in 2020.
All-Weather Access Road (AWAR)			
2018	P-4	■ The erosion of the culverts is stable. The progression of the erosion of culverts PC-17A (8+830), PC-11 (39+552), R14 (67+840), R18-B (82+500), R-20 (85+490), R-23 (93+600) and R24 (98+100) should be monitored at freshet for any signs of progression or washout, as signs of water flowing beneath the road were observed at these locations.	■ Still the case in 2020.
2018	P-4	■ For some culvert locations, monitoring is recommended to see if flow occurs through the culvert (i.e., during the freshet). If insufficient capacity to handle the flows is observed, or water	■ Still the case in 2020 with the addition of PC-1 (9+952).

Table 2: Summary of Recommendations and Priority Levels from the 2020 Geotechnical Inspection

Year of Recommendation	Priority Level[(1)]	Recommended Action	Follow up the years after
		circulates under the road, then it is recommended to clear the obstructions or repair the culverts. Particular attention should be paid to R-00A (2+550), PC-14 (4+260), the unnamed culvert at 5+700, and PC-16 (54+950).	
Whale Tail Project Road			
2019	P-3	■ Obstructed and damaged culverts were observed at some locations: #5 (117+525), #7 (118+013), #7-2 (118+016), #13 (120+615), #27-2 (123+300), #45 (125+710), #48 (127+203), #54 (128+388), #55 (128+440), #64 (129+920), #65 (130+924), #83 (136+300), #85 (136+671), #86 (136+740), #88 (136+861), #89 (137+180), #93 (138+100), #97 (138+436), #98 (138+482), #101 (139+025), #105 (140+555), #112 (142+630), #113 (142+736), #115 (142+865), #116 (142+940), #117 (143+173), #118 (143+433), #133 (148+141), #150 (152+171 to 152+179), #151 (152+562), #160 (155+966), #163 (156+474), #192 (163+190), #234 (170+385), #241 (171+235), #268 (175+774), #278 (177+870), #283 (178+965), #284-2 (179+072). If insufficient capacity to handle the flow is observed at locations where culverts are obstructed or damaged, it is recommended to clear the obstructions or repair the culvert. It is still recommended to monitor culverts #167 (41+843) and #232 (53+928), where there are signs of water flowing below the culverts.	■ Still the case in 2020.
2020	P-3	■ The road material, constituted of fine esker-like material, was observed to be eroded on the shoulders and side slopes by run-off water, especially at km 174 and 177. ■ Settlement of the east shoulder was observed at km 176.5. Ponding water present at the toe of the slope. It is recommended to repair the eroded sections of the road, to be on the watch for further signs of erosion along the high sandy side slopes along the road and to backfill potential erosion as soon as it is noticed.	**Conditionally resolved in 2020:** the road was repaired after the summer of 2020 according to AEM. The repairs will be inspected during next year's site visit.
Quarries and Eskers			
2018	P-4	■ Presence of unstable blocks and loose rocks along steep walls and unstable slopes was observed in Quarries 3, 7, 9, 10, 12, 16, and 23, as well as all eskers and quarries along the Whale Tail Project road except Esker #5. It is recommended that workers be cautious in these quarries and are aware of the potential hazard.	■ Still the case in 2020 with Quarries 3, 7, 9, 10, 16, 18 and 23, as well as with all eskers excepted #3, #5 and #6.

Table 2: Summary of Recommendations and Priority Levels from the 2020 Geotechnical Inspection

Year of Recommendation	Priority Level[(1)]	Recommended Action	Follow up the years after
Bulk Fuel Facilities			
Baker Lake Tank Farm			
2018	P-4	■ Ponded water within most containment cells was observed. Removal of water should be managed to keep the water accumulation at a minimum near the tank foundation.	■ Still the case in 2020, although the amount of ponding water has decreased since 2019.
2018	P-3	■ The granular fill material protecting the geomembrane was eroded due to wave actions in some areas, exposing the geomembrane. This condition was observed all along the south side of Tanks 3 and 4 and on the west side of Tank 1. A section of exposed geomembrane with a fold was observed at the northwestern corner of Tank 2 and the northeastern corner of Tank 4. It is recommended to cover the exposed area with geotextile and fill material to re-establish the liner protection. Liner is exposed on the northern side of Tank 5. As this condition appears above the elevation of the southern berm, it is considered that the protection of the liner with granular material is not as important as in other areas; however, it remains a good practice and provides protection against animal damage.	■ 2020: partially resolved: ▪ Exposed geomembrane no longer observed at the northwestern corner of Tank 2, along the south side of Tanks 3 and 4, and on the west side of Tank 1. ▪ Granular protection repaired on the northern side of Tank 5 in 2019. ▪ Still exposed geomembrane and in the northeastern corner of Tank 4.
2018	P-2	■ A hole in the exposed geomembrane (300 mm diameter hole) was observed on the south southwestern corner of Tank 3 at the toe of the slope. The hole in the geomembrane should be repaired to ensure a good performance of the retention basin. It is also recommended to cover the exposed area with geotextile and fill material to re-establish the liner protection.	■ 2020: the geomembrane was repaired. It was still exposed and should be covered with geotextile and granular material.
2019	P-2	■ A small hole in the liner was observed on the northern side of the containment cell of the 20 Jet A fuel tanks. The hole in the geomembrane should be repaired to ensure a good performance of the retention basin.	■ Resolved in 2020: no longer observed.
2018	P-3	■ Animal burrows were observed near the southern corner of Tank 2. It is recommended to assess whether the geosynthetics have been damaged under the granular cover at one location at least.	■ Still the case in 2019: animal burrows have shifted to the south side of Tanks 3 and 4
2018	P-4	■ The embankments around the tank farm containment areas were stable. Tension cracks observed in the past on the upper bench north of Tanks 3 and 4 and south of Tanks 5 and 6 are disappearing. There were signs of water flow in this area.	■ Resolved in 2020: no more cracks observed.

Table 2: Summary of Recommendations and Priority Levels from the 2020 Geotechnical Inspection

Year of Recommendation	Priority Level[(1)]	Recommended Action	Follow up the years after
2018	P-2	■ The bituminous geomembrane around the tanks of the 20 Jet A fuel tanks is damaged by the Jet A fuel (melting). It is recommended to remain vigilant during the freshet and throughout the year to manage water accumulated within the bermed area. It is recommended that AEM sample the liner for performance testing by a geosynthetics laboratory and take appropriates measures to protect the environment.	■ 2020: the bituminous geomembrane no longer shows signs of melting. It is unknown how the melting affected the integrity of the liner. If the liner is damaged, contaminated water could seep into the environment.
2020	P-2	■ A hole in the liner was observed on the southwestern corner of the containment cell of the 20 Jet A fuel tanks. The hole in the geomembrane should be repaired to ensure a good performance of the retention basin	
2020	P-3	■ On the northern side of Tank 5, tension cracks parallel to the slope (10 to 30 mm wide) and signs of settlement (about 50 to 100 m) were observed in the fine filter surface on top of the slope and on the crest. The area should be monitored and repaired if needed to re-establish liner protection.	
Meadowbank Tank Farm			
2018	P-4	■ Ponded water within the secondary containment cell was observed. Removal of water should be managed to keep the water accumulation at a minimum near the tank foundation.	■ Still the case in 2020.
Whale Tail Project Tank Farm			
2019	P-3	■ A tension crack was observed on the side of the excavation of the new tank farm and probably originates from settling of the thawing foundation, the winter construction, and the steep side slope. It should be monitored for differential settlement that might affect liner integrity. Consideration to soften the side slope should be made if degradation of the conditions continues.	■ The tension crack is no longer visible. The embankment is stable.
Other Meadowbank structures			
Meadowbank Site Roads			
2018	P-4	■ Three culverts were installed on Vault Road (coordinates 640 964 E / 7 217 466 N). As previously observed in past annual inspections, these three culverts were partially collapsed in the middle and showed signs of erosion at the inlet. This is currently not a significant issue, but it is recommended to monitor these culverts at	■ Still the case in 2020

Table 2: Summary of Recommendations and Priority Levels from the 2020 Geotechnical Inspection

Year of Recommendation	Priority Level[(1)]	Recommended Action	Follow up the years after
		freshet to ensure that they provide sufficient capacity and that erosion is not occurring.	
Landfill and Contaminated Soil Storage and Bioremedial Landfarm Facility			
2018	P-2	■ The landfarm lies over a natural steep slope covered by rockfill as a pad made to operate the landfarm. The slope is considered at risk for high deformation to slope failure. The risk will increase as the water level in the South Cell raises. Signs of superficial slope failure were observed during the inspection. It is recommended to watch out for signs of instability and be prepared to close off the area if need be. Workers who access the area should be informed of the potential risk and be trained to recognize signs of instability.	■ 2020: The tension cracks are disappearing. It is recommended to keep this area on watch for further development.
Other Whale Tail Project **structures**			
Saline Ditch			
2020	P-3	■ The outlet of the ditch towards the AP5 quarry, constituted of a culvert beneath the road, was obstructed at its outlet and water was ponding at its inlet and in the southwestern extremity of the Saline Ditch. It is recommended to clear this culvert.	
Sumps and Non-Contact Water Management Infrastructures			
2020	P-3	■ The sandy material which the seacans are installed on has settled and eroded at stations P1, P3 and P4. No damage to the stations themselves has been observed so far, however it is recommended to repair the seacan foundations with non-erodible material such as rockfill	
Site Roads			
2020	P-4	■ A culvert should be installed on Road 22 near the Mammoth Lake diffuser beneath the road to avoid erosion issues.	

Table 2: Summary of Recommendations and Priority Levels from the 2020 Geotechnical Inspection

Year of Recommendation	Priority Level(1)	Recommended Action	Follow up the years after
		■ Road 24, along the South Whale Tail Channel, shows large settlement and tension cracks. It is recommended to repair the road to re-establish the rolling surface. ■ Road 25, that goes around the Whale Tail WRSF, has a rough surface. It is recommended to add granular material to the road surface and to grade it.	
Additional recommendations			
2019	P-4	■ Since AEM is a member of the Mining Association of Canada, it is recommended that a tailings management audit be held in the framework of the Towards Sustainable Mining initiative.	■ Still the case in 2020.

Note: (1) Priority Level Descriptions

P-1: A high priority or actual structure safety issues considered immediately dangerous to life, health, or the environment, or a significant risk of regulatory enforcement.

P-2: If not corrected could likely result in structure safety issues leading to injury, environmental impact, or significant regulatory enforcement; or, a repetitive deficiency that demonstrates a systematic breakdown of procedures.

P-3: Single occurrences of deficiencies or non-conformance that alone would not be expected to result in structure safety issues.

P-4: Best Management Practice – further improvements are necessary to meet industry best practices or reduce potential risks.

Signature Page

Golder Associés Ltée

ORIGINAL SIGNED AND SEALED BY ORIGINAL SIGNED AND SEALED BY

Marion Habersetzer, P.Eng.
Geotechnical Engineer

Yves Boulianne, P.Eng.
Associate, Senior Geotechnical Engine

MH/YB

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13.0 REFERENCES

AEM (Agnico-Eagle Mines Ltd., Meadowbank Complex). 2018. *Emergency Response Plan, ,Whale Tail Project*. Version 12. January 2018.

AEM (Agnico-Eagle Mines Ltd., Meadowbank Complex). 2020. *Emergency Response Plan, Meadowbank Complex*. Version 15. June 2020.

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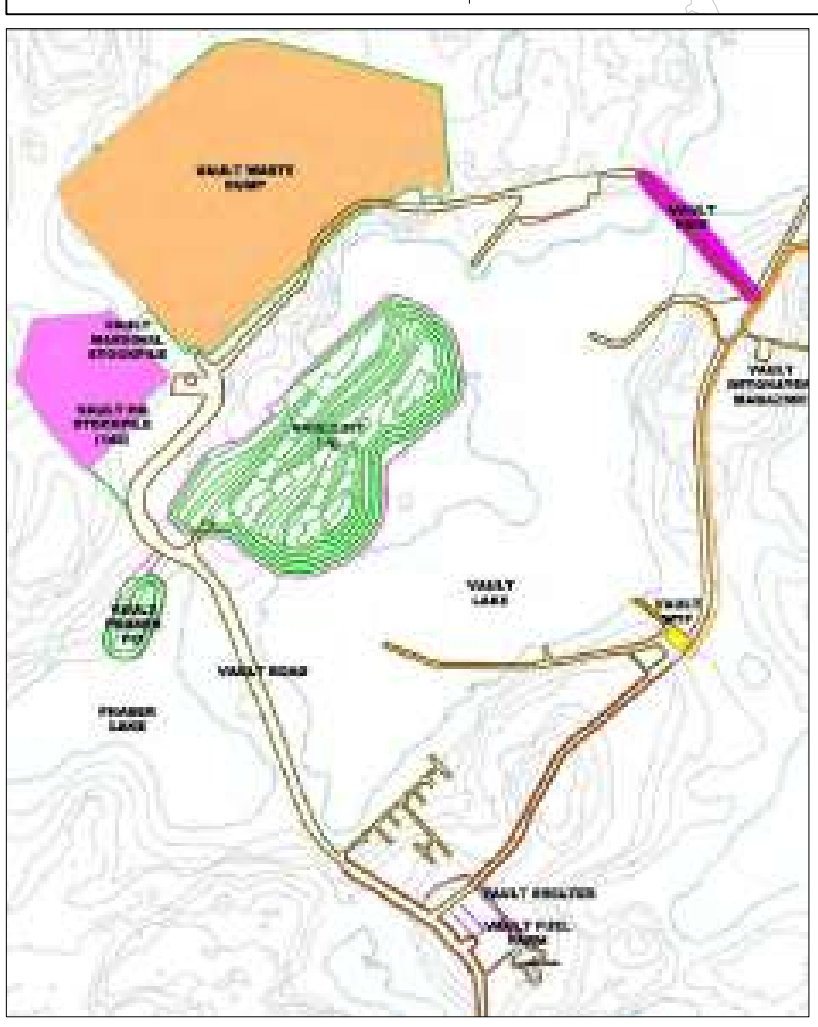
AEM 2019b. *Tailings Storage Facilities Operation, Maintenance and Surveillance Manual*. Version 9. March 2019.

Ministry of Energy and Mines, 2017. *Health, Safety and Reclamation Code for Mines in British Columbia*. June 2017.

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7 217 000 m N
637 000 m E
638 000 m E
639 000 m E
7 216 000 m N
7 215 000 m N
7 214 000 m N
7 213 000 m N
7 212 000 m N

NORTH CELL INTERNAL STRUCTURE
EASTERN DIVERSION DITCH
ALL-WEATHER PRIVATE ROAD TO BAKER LAKE
WESTERN DIVERSION DITCH
NP2 LAKE
VAULT ROAD
RSF TILL PLUG
APPROXIMATE LIMITS OF WATER POND
RF2
SADDLE DAM 1
NP1 LAKE
PORTAGE ROCK STORAGE FACILITY
LANDFILL
TSF NORTH CELL
RF1
CAPPING 2016
RECLAIM BARGE RAMP
NEW LANDFARM AREA INTO SOUTH CELL
SADDLE DAM 2
STORMWATER DIKE
BUTTRESS
PORTAGE PIT A
SADDLE DAM 3
TSF SOUTH CELL
CENTRAL DIKE
AIRSTRIP
TAILINGS BEACH
SECOND PORTAGE LAKE
SADDLE DAM 4
EAST DIKE
SADDLE DAM 5
PORTAGE CENTRAL DUMP
THIRD PORTAGE LAKE
PLANT SITE AND CAMP AREA
STORMWATER POND 1
FRESH WATER BARGE
PORTAGE PIT E PUSHBACK
TANK FARM
PORTAGE NPAG DUMP
FGL SANA SHOP
SOUTH CAMP DIKE
GOOSE NPAG DUMP
SOUTH CAMP ISLAND
BAY GOOSE DIKE
GOOSE PIT
THIRD PORTAGE LAKE



CONFIDENTIAL

0 250 500
1:15,000 METRES

LEGEND

TOPOGRAPHIC CONTOUR

NOTE

GRID REFERENCE: NAD 83, UTM ZONE 14.

REFERENCE

DRAWING BASE PROVIDED BY AEM LTD., MEADOWBANK DIVISION IN "MBK Site map updated JULY 2014.dwg" DATED JULY 8, 2014.

CLIENT
AGNICO EAGLE

CONSULTANT
GOLDER

YYYY-MM-DD	2020-10-20
PREPARED	M. Habersetzer
DESIGN	R. Gravel
REVIEW	M. Habersetzer
APPROVED	Y. Boulianne

PROJECT
2020 ANNUAL GEOTECHNICAL INSPECTION
MEADOWBANK GOLD MINE, NUNAVUT

TITLE
MEADOWNBANK MINE SITE DURING THE ANNUAL INSPECTION OF 2020

PROJECT No.	PHASE	Rev.	FIGURE
20144230	5000	0	1

0 25 mm IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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639 600 m E
639 400 m E
639 200 m E
639 000 m E
7 214 600 m N
7 214 400 m N
7 214 200 m N
7 214 000 m N
7 213 800 m N
7 213 600 m N

SECOND PORTAGE LAKE

EAST DIKE (AS BUILT)

67 65 66 63 64 62 61 59 60 58 57 56

60+850 60+800 60+750 60+700 60+650 60+600 60+550 60+500 60+450 60+400 60+350 60+300 60+250 60+200 60+150 60+100 60+050 60+000 60+900

EAST ROAD

ZONE OF SEEPAGE

ZONES OF SEEPAGE EQUIPED WITH VERTICAL CULVERT AND PUMPS IN SEACAN WITH FLOW METERS

PORTAGE CENTRAL DUMP

PORTAGE PIT A

PORTAGE PIT E PUSHBACK

P

LEGEND

TOPOGRAPHIC CONTOUR

1 IDENTIFICATION AND DIRECTION OF PHOTOGRAPHY TAKEN DURING THE ANNUAL INSPECTION OF 2020

NOTE

GRID REFERENCE: NAD 83, UTM ZONE 14.

REFERENCE

DRAWING BASE PROVIDED BY AEM LTD., MEADOWBANK DIVISION IN "MBK Site map updated JULY 2014.dwg" DATED JULY 8, 2014.

CONFIDENTIAL

0 100 200
1:4 000 METRES

CLIENT
AGNICO EAGLE

PROJECT
2020 ANNUAL GEOTECHNICAL INSPECTION
MEADOWBANK GOLD MINE, NUNAVUT

TITLE
EAST DIKE DURING THE ANNUAL INSPECTION OF 2020

CONSULTANT
GOLDER

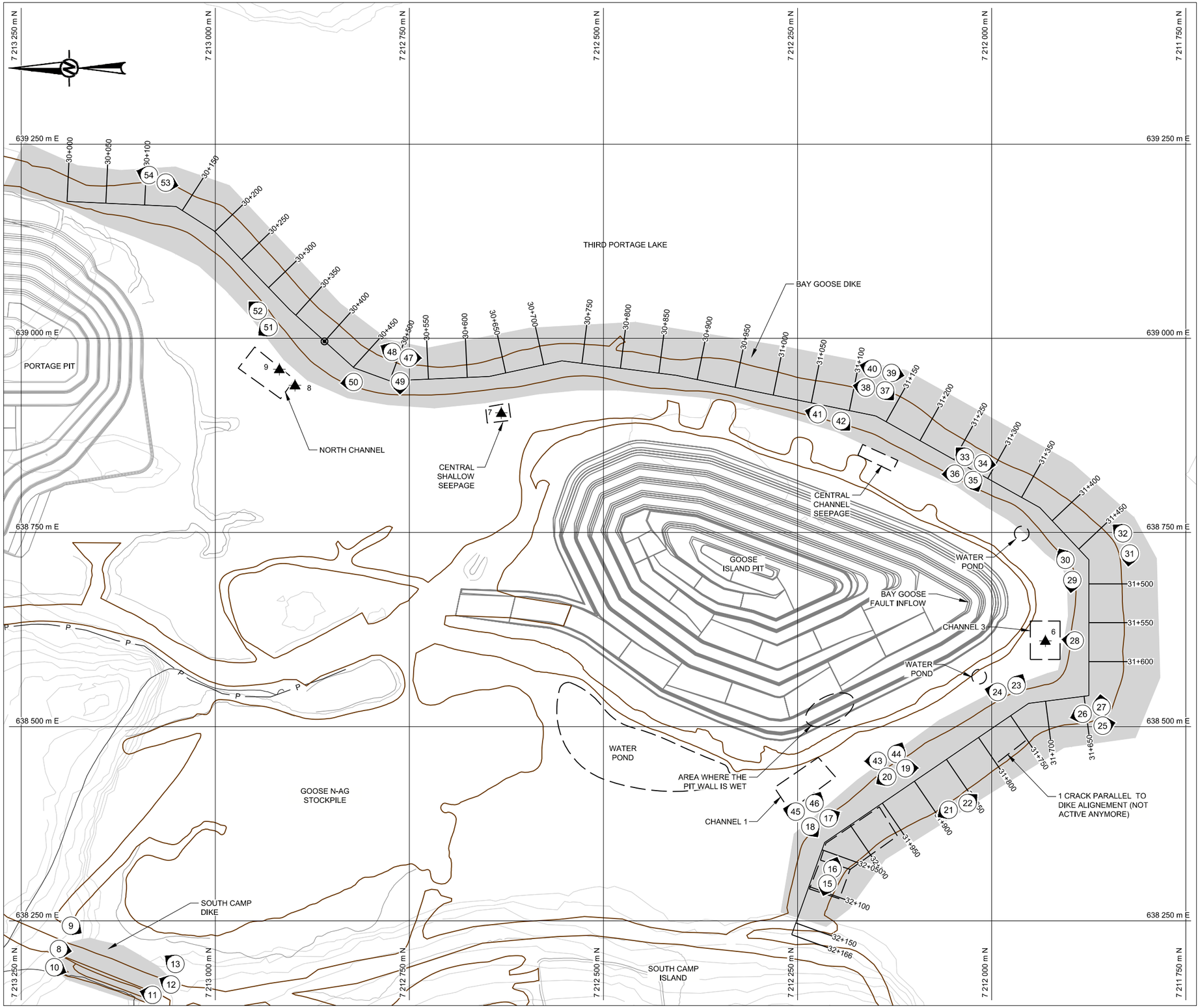
YYYY-MM-DD	2020-10-20
PREPARED	M. Habersetzer
DESIGN	R. Gravel
REVIEW	M. Habersetzer
APPROVED	Y. Boulianne

PROJECT No.	PHASE	Rev.	FIGURE
20144230	5000	0	A1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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LEGEND

- TOPOGRAPHIC CONTOUR
- (1) IDENTIFICATION AND DIRECTION OF PHOTOGRAPHY TAKEN DURING THE ANNUAL INSPECTION OF 2020
- MANUAL MONITORING FLOW STATION
- (1) WATER ACCUMULATION. NO SIGN OF FLOW.

NOTE

GRID REFERENCE: NAD 83, UTM ZONE 14.

REFERENCE

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IN "MBK Site map updated JULY 2014.dwg" DATED JULY 8, 2014.

CONFIDENTIAL

0 100 200
1:5 000 METRES

CLIENT

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PROJECT

2020 ANNUAL GEOTECHNICAL INSPECTION
MEADOWBANK GOLD MINE, NUNAVUT

TITLE

BAY-GOOSE AND SOUTH CAMP DIKES DURING THE ANNUAL INSPECTION OF 2020

CONSULTANT

GOLDER

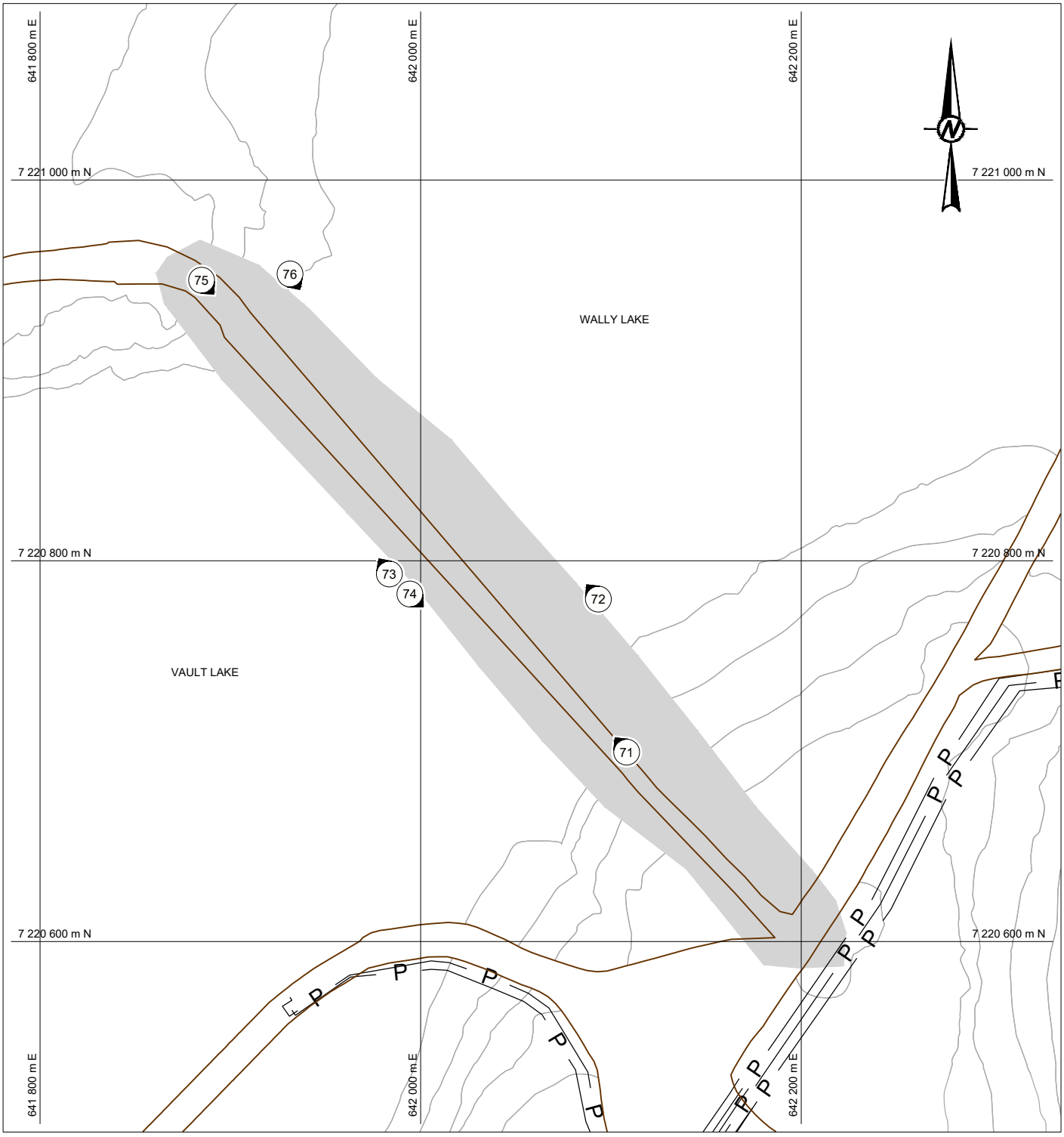
YYYY-MM-DD	2020-10-20
PREPARED	M. Habersetzer
DESIGN	R. Gravel
REVIEW	M. Habersetzer
APPROVED	Y. Boulianne

PROJECT No.	PHASE	Rev.	FIGURE
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LEGEND

TOPOGRAPHIC CONTOUR

1 IDENTIFICATION AND DIRECTION OF PHOTOGRAPHY TAKEN DURING THE ANNUAL INSPECTION OF 2020

NOTE

GRID REFERENCE: NAD 83, UTM ZONE 14.

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GOLDER

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PREPARED	M. Habersetzer
DESIGN	R. Gravel
REVIEW	M. Habersetzer
APPROVED	Y. Boulianne

PROJECT

2020 ANNUAL GEOTECHNICAL INSPECTION
MEADOWBANK GOLD MINE, NUNAVUT

TITLE

VAULT DIKE DURING THE ANNUAL INSPECTION OF 2020

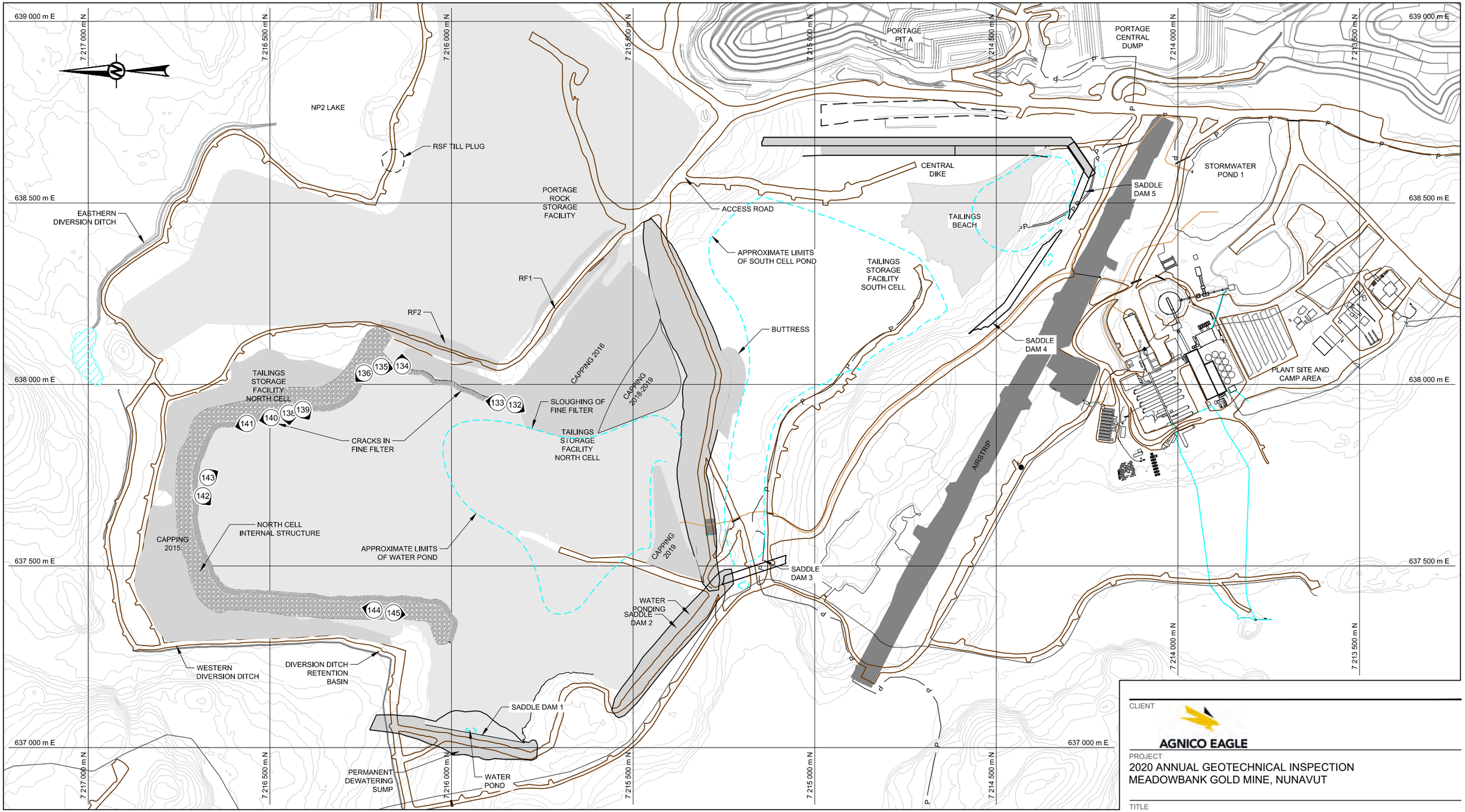
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A

25 mm

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LEGEND

TOPOGRAPHIC CONTOUR

1 IDENTIFICATION AND DIRECTION OF PHOTOGRAPHY TAKEN DURING THE ANNUAL INSPECTION OF 2020

NOTE

GRID REFERENCE: NAD 83, UTM ZONE 14.

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CONFIDENTIAL

0 250 500
1:10 000 METRES

CLIENT

AGNICO EAGLE

PROJECT

2020 ANNUAL GEOTECHNICAL INSPECTION
MEADOWBANK GOLD MINE, NUNAVUT

TITLE

GENERAL VIEW OF TAILINGS STORAGE FACILITY DURING THE ANNUAL INSPECTION OF 2020

CONSULTANT

GOLDER

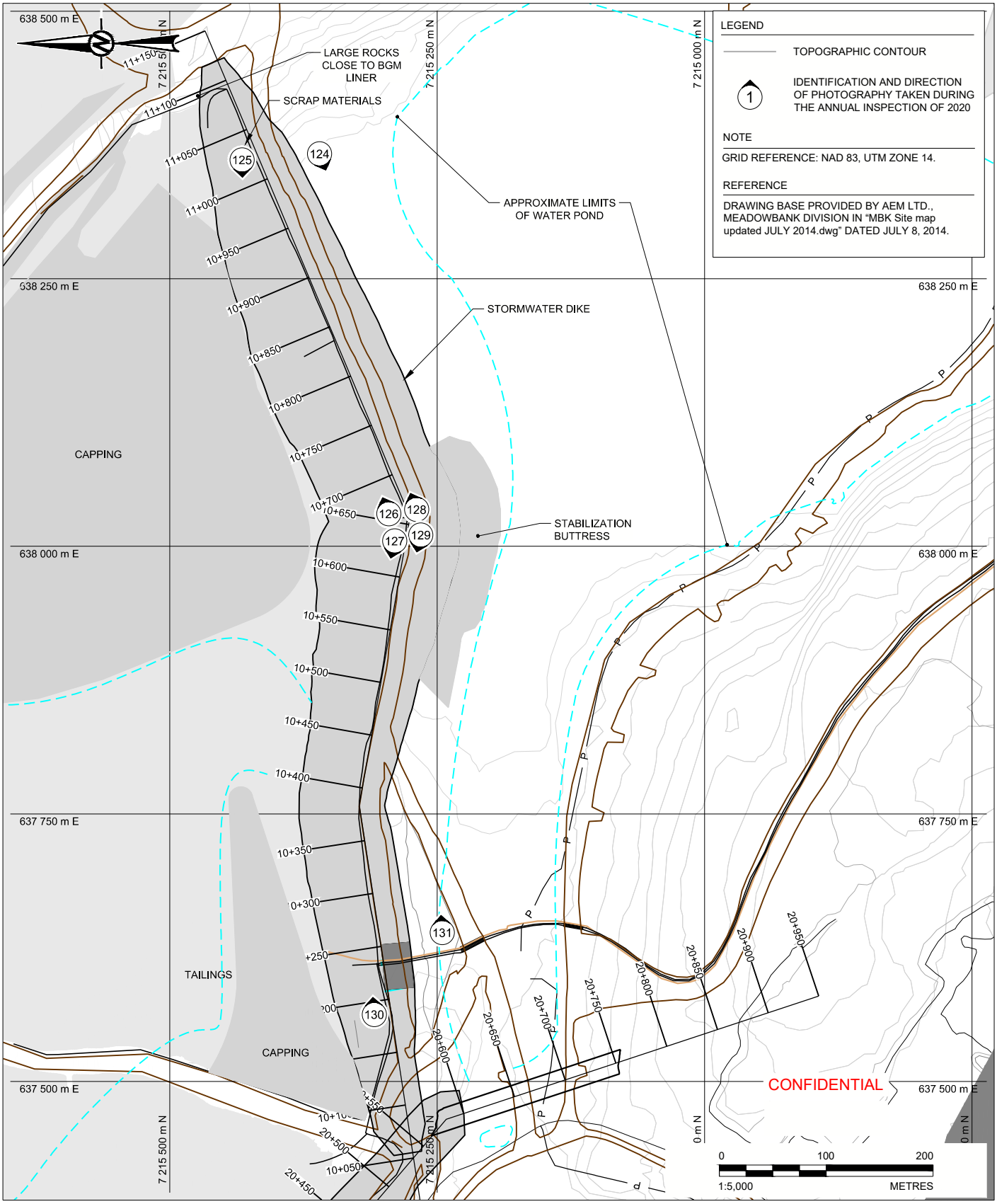
YYYY-MM-DD	2020-10-20
PREPARED	M. Habersetzer
DESIGN	R. Gravel
REVIEW	M. Habersetzer
APPROVED	Y. Boulianne

PROJECT No.	PHASE	Rev.	FIGURE
20144230	5000	0	B1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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YYYY-MM-DD	2020-10-20
PREPARED	M. Habersetzer
DESIGN	R. Gravel
REVIEW	M. Habersetzer
APPROVED	Y. Boulianne

PROJECT

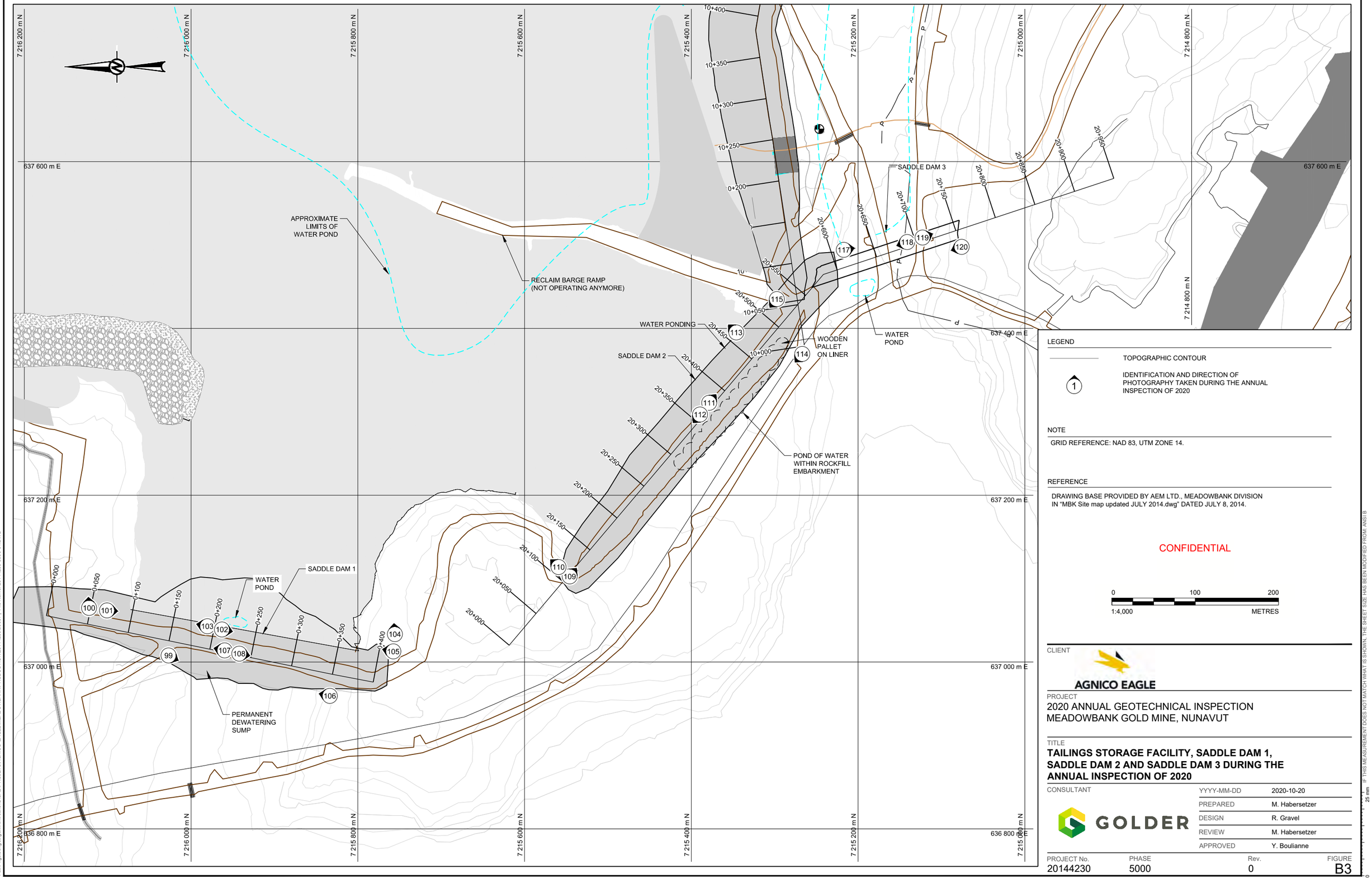
2020 ANNUAL GEOTECHNICAL INSPECTION
MEADOWBANK GOLD MINE, NUNAVUT

TITLE

STORMWATER DIKE DURING THE ANNUAL INSPECTION OF 2020

PROJECT No.	PHASE	Rev.	FIGURE
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LEGEND

TOPOGRAPHIC CONTOUR

1 — IDENTIFICATION AND DIRECTION OF PHOTOGRAPHY TAKEN DURING THE ANNUAL INSPECTION OF 2020

NOTE

GRID REFERENCE: NAD 83, UTM ZONE 14.

REFERENCE

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IN "MBK Site map updated JULY 2014.dwg" DATED JULY 8, 2014.

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0 100 200
1:4,000 METRES

CLIENT

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PROJECT

2020 ANNUAL GEOTECHNICAL INSPECTION
MEADOWBANK GOLD MINE, NUNAVUT

TITLE

TAILINGS STORAGE FACILITY, SADDLE DAM 1, SADDLE DAM 2 AND SADDLE DAM 3 DURING THE ANNUAL INSPECTION OF 2020

CONSULTANT

GOLDER

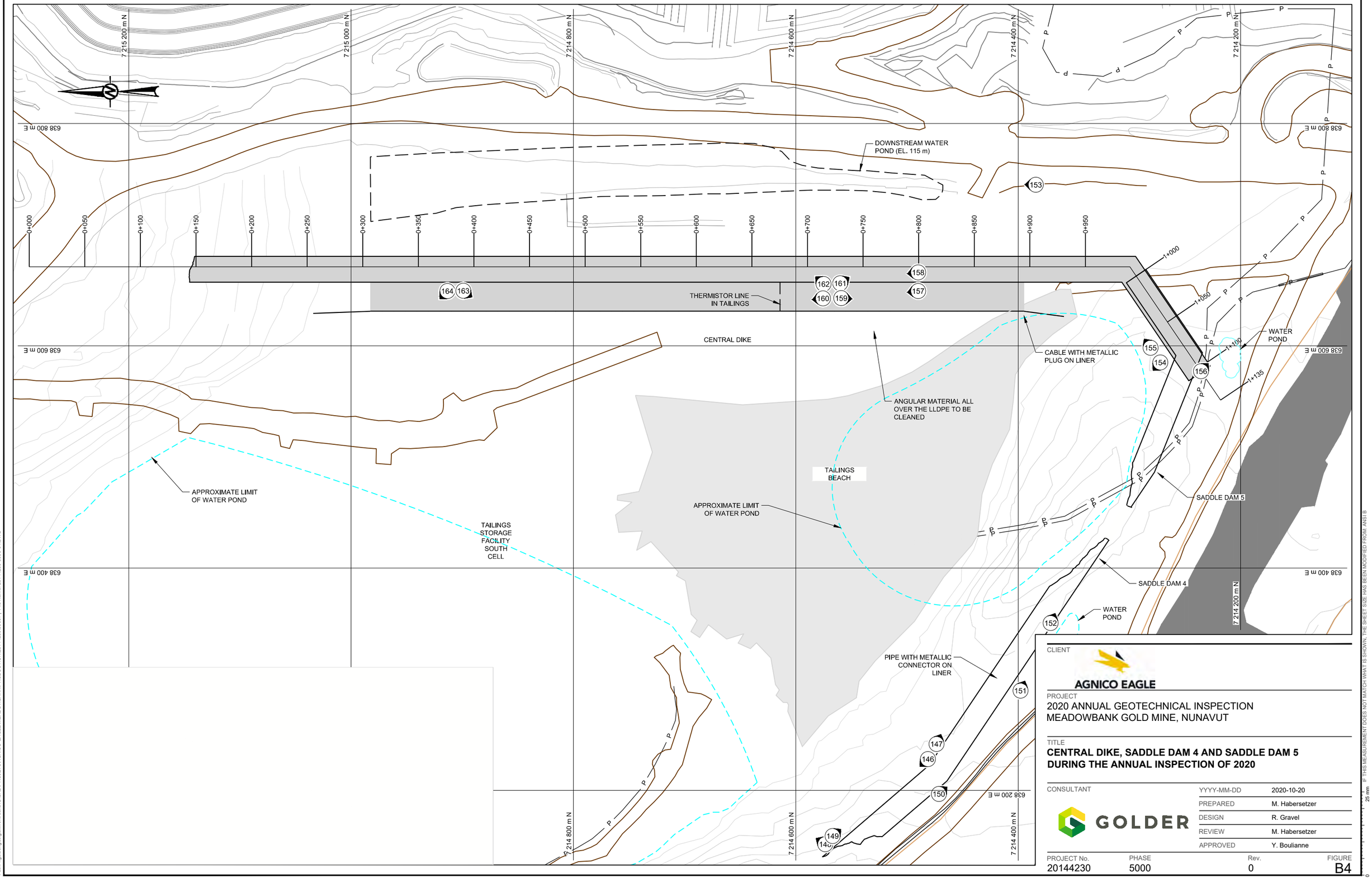
YYYY-MM-DD	2020-10-20
PREPARED	M. Habersetzer
DESIGN	R. Gravel
REVIEW	M. Habersetzer
APPROVED	Y. Boulianne

PROJECT No.	PHASE	Rev.	FIGURE
20144230	5000	0	B3

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

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CLIENT

AGNICO EAGLE

PROJECT

2020 ANNUAL GEOTECHNICAL INSPECTION
MEADOWBANK GOLD MINE, NUNAVUT

TITLE

CENTRAL DIKE, SADDLE DAM 4 AND SADDLE DAM 5 DURING THE ANNUAL INSPECTION OF 2020

CONSULTANT

GOLDER

YYYY-MM-DD	2020-10-20
PREPARED	M. Habersetzer
DESIGN	R. Gravel
REVIEW	M. Habersetzer
APPROVED	Y. Boulianne

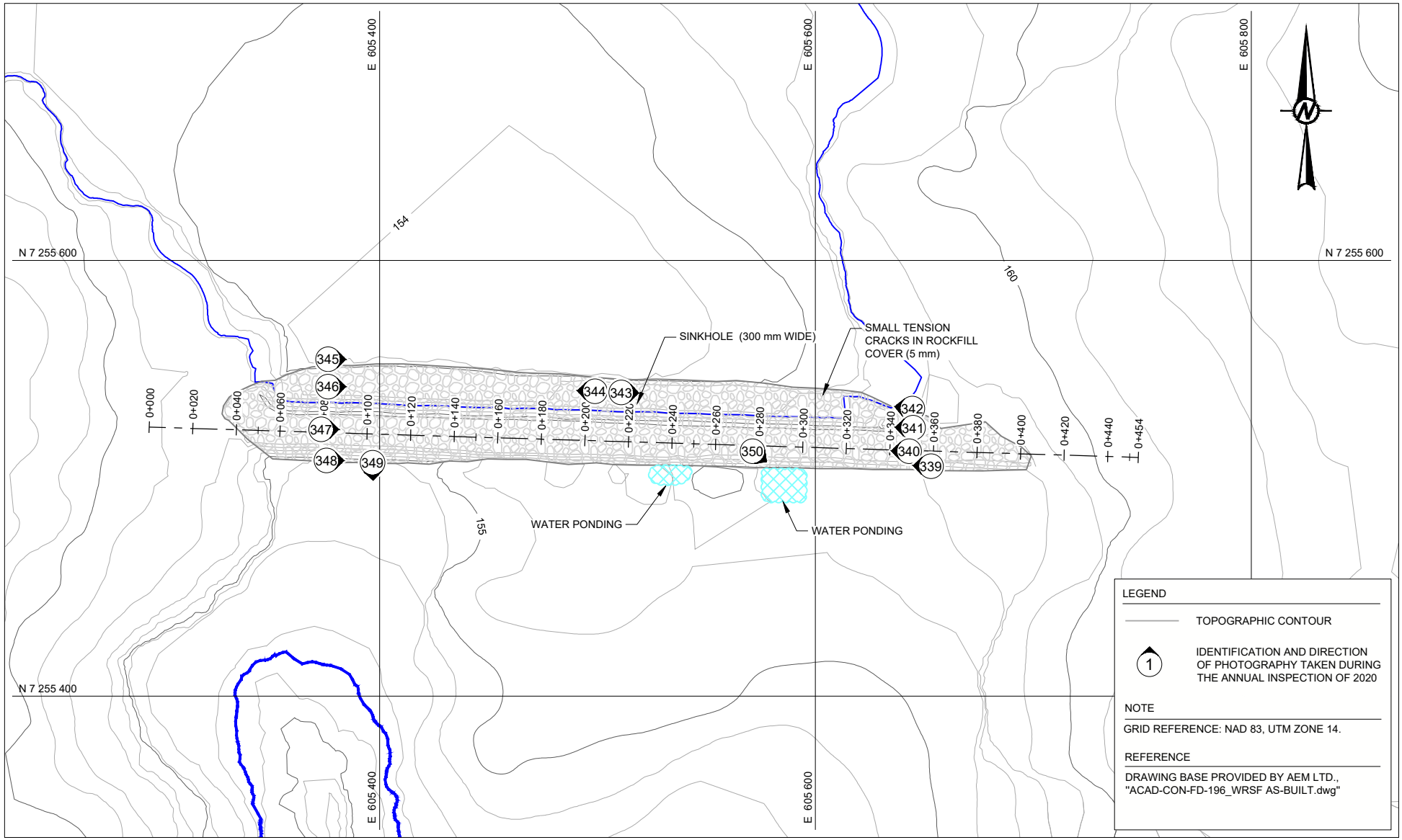
PROJECT No.	PHASE	Rev.	FIGURE
20144230	5000	0	B4

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CONFIDENTIAL

0 50 100
1:2 500 METRES

CLIENT
AGNICO EAGLE

CONSULTANT
GOLDER

YYYY-MM-DD	2020-10-21
DESIGNED	R. Gravel
PREPARED	M. Habersetzer
REVIEWED	M. Habersetzer
APPROVED	Y. Boulianne

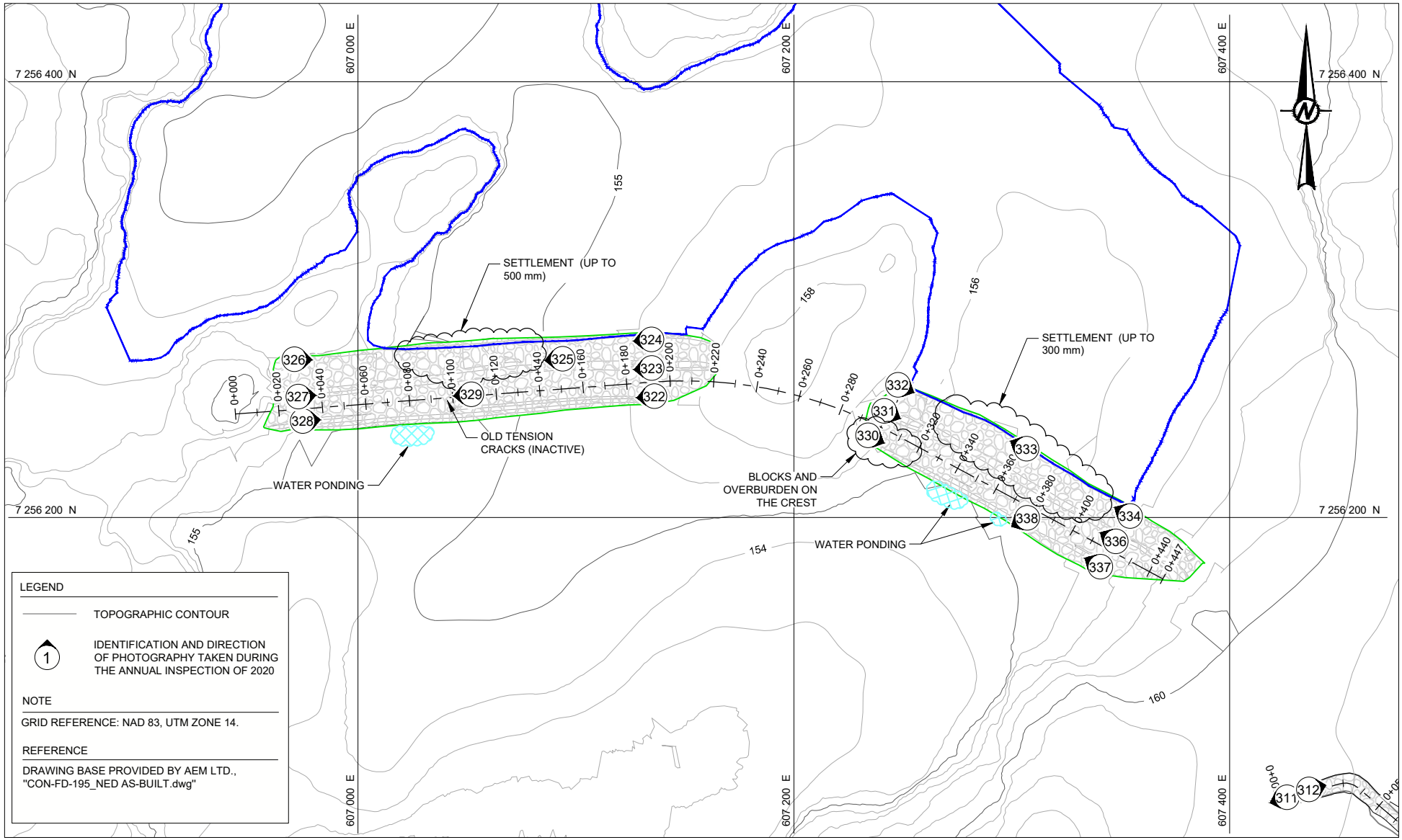
PROJECT
2020 ANNUAL GEOTECHNICAL INSPECTION
MEADOWBANK GOLD MINE, NUNAVUT

TITLE
WRSF DIKE DURING THE ANNUAL INSPECTION OF 2020

PROJECT NO.	PHASE	REV.	FIGURE
20144230	5000	0	C1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
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Last Edited By: iarroub Date: 2020-12-23 Time:10:24:25 AM | Printed By: IArroub Date: 2020-12-23 Time:10:35:32 AM
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CONFIDENTIAL

0 50 100
1:2 500 METRES

CLIENT
AGNICO EAGLE

CONSULTANT
GOLDER

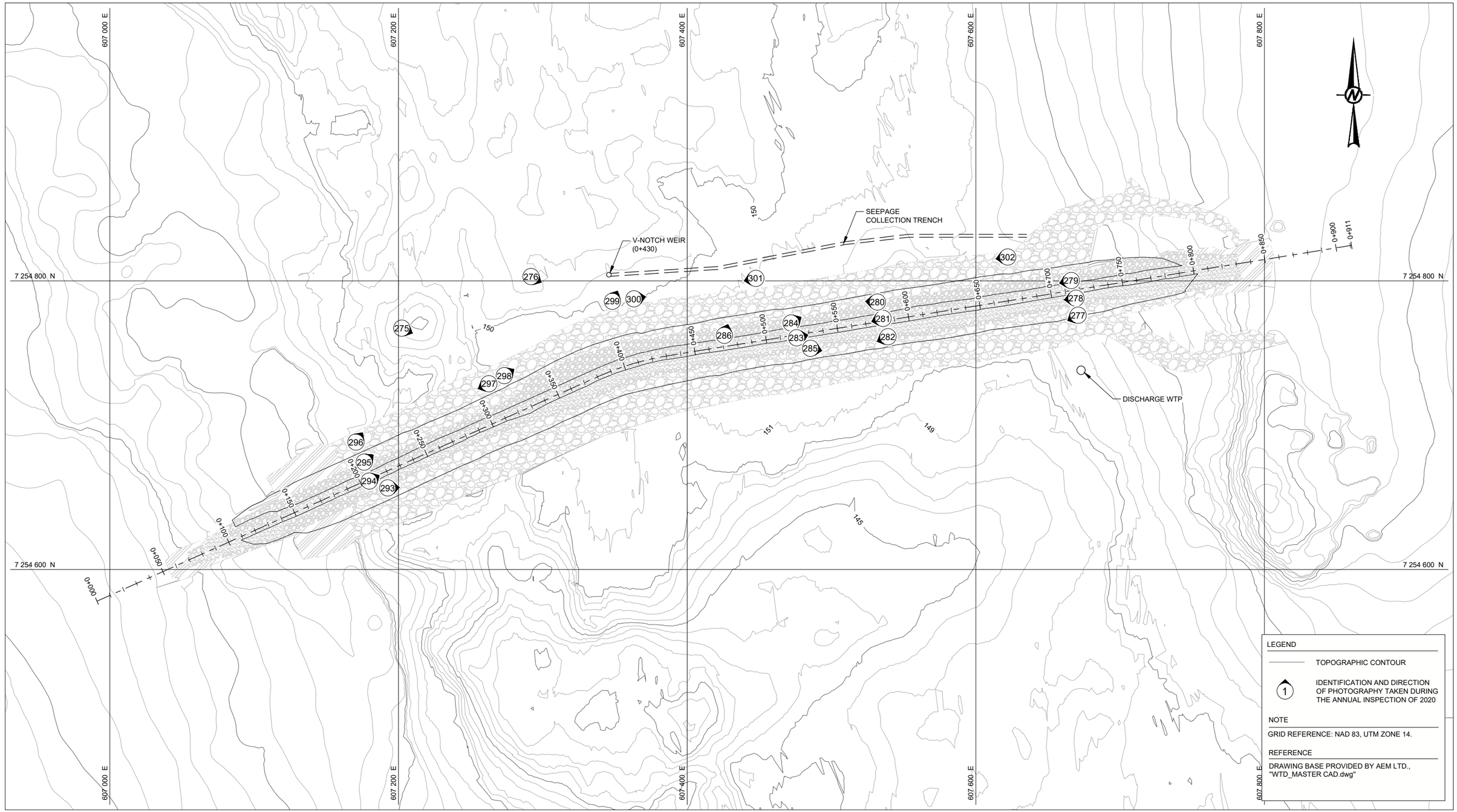
YYYY-MM-DD	2020-10-21
DESIGNED	R. Gravel
PREPARED	M. Habersetzer
REVIEWED	M. Habersetzer
APPROVED	Y. Boulianne

PROJECT
2020 ANNUAL GEOTECHNICAL INSPECTION
MEADOWBANK GOLD MINE, NUNAVUT

TITLE
NORTH EAST DIKE DURING THE ANNUAL INSPECTION OF 2020

PROJECT NO.	PHASE	REV.	FIGURE
20144230	5000	0	C2

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
0 25 mm



CONFIDENTIAL

0 50 100
1:2 500 METRES

CLIENT
AGNICO EAGLE

CONSULTANT
GOLDER

YYYY-MM-DD	2020-10-21
DESIGNED	R. Gravel
PREPARED	M. Habersetzer
REVIEWED	M. Habersetzer
APPROVED	Y. Boulianne

PROJECT
2020 ANNUAL GEOTECHNICAL INSPECTION
MEADOWBANK GOLD MINE, NUNAVUT

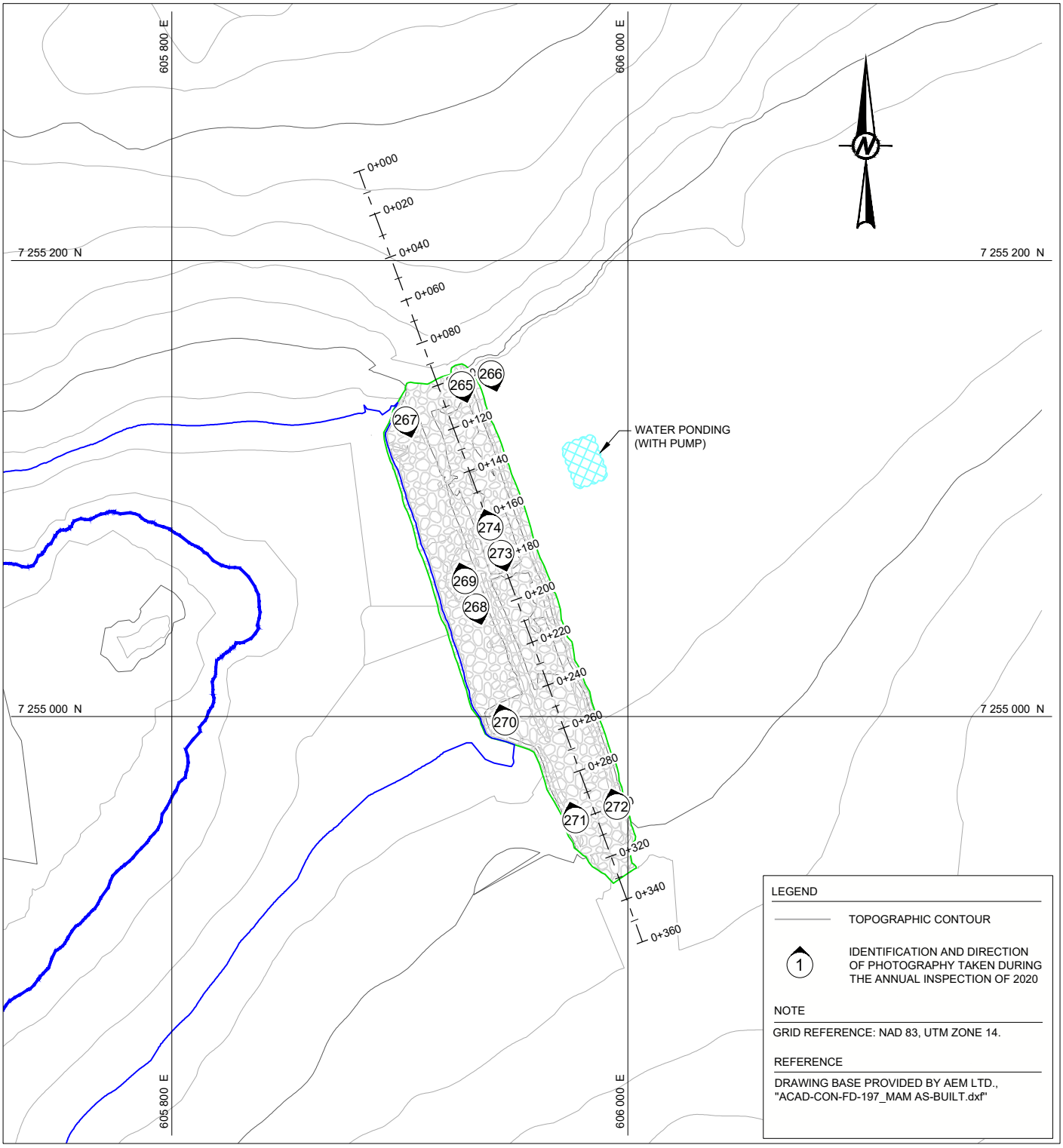
TITLE
WHALE TAIL DIKE DURING THE ANNUAL INSPECTION OF 2020

PROJECT NO.	PHASE	REV.	FIGURE
20144230	5000	0	C3

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CONFIDENTIAL

0 50 100
1:2 500 METRES

CLIENT
AGNICO EAGLE

CONSULTANT
GOLDER

YYYY-MM-DD	2020-10-21
DESIGNED	R. Gravel
PREPARED	M. Habersetzer
REVIEWED	M. Habersetzer
APPROVED	Y. Boulianne

PROJECT
2020 ANNUAL GEOTECHNICAL INSPECTION
MEADOWBANK GOLD MINE, NUNAVUT

TITLE
MAMMOTH DIKE DURING THE ANNUAL INSPECTION OF 2020

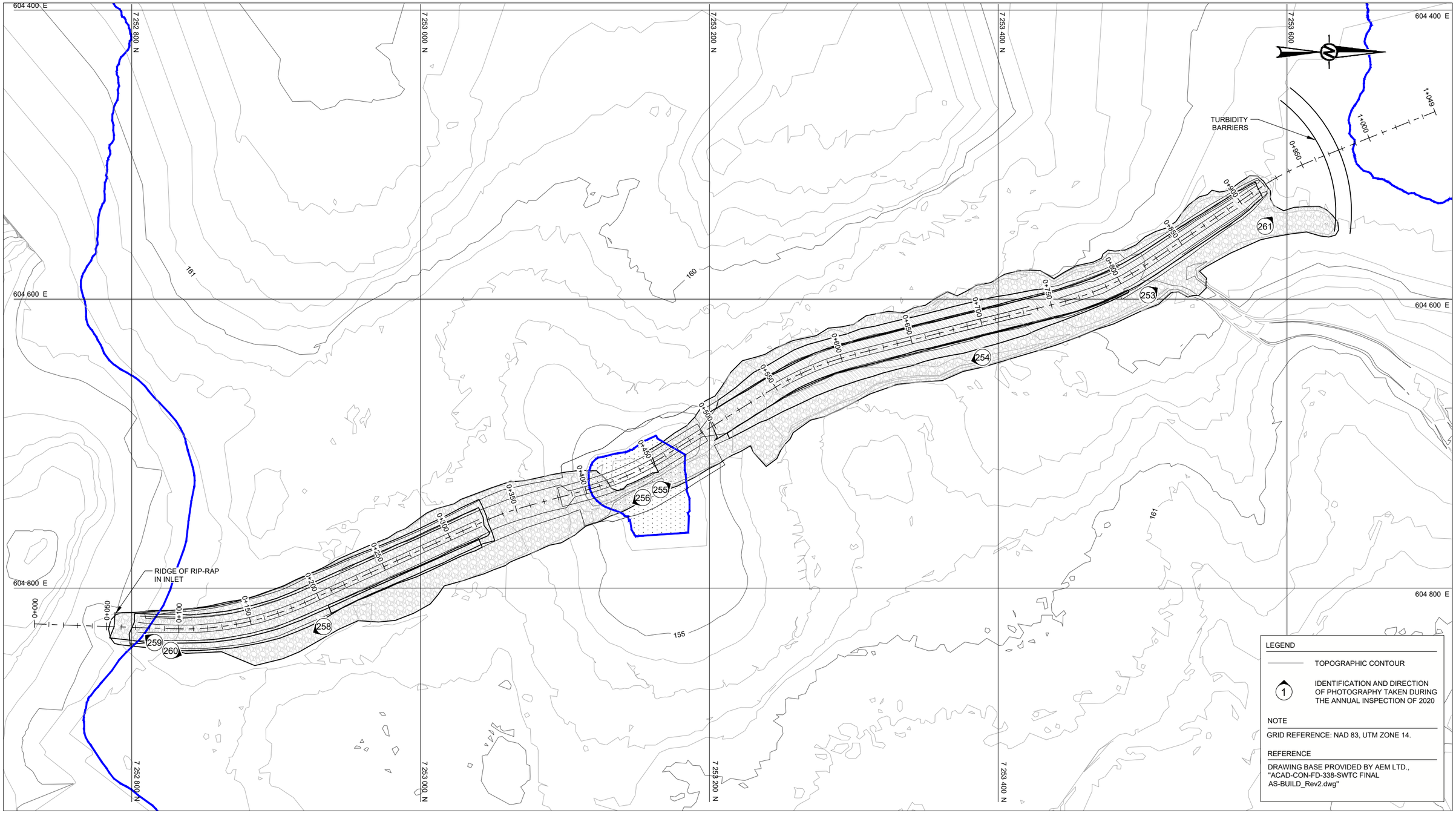
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20144230	5000	0	C4

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LEGEND

TOPOGRAPHIC CONTOUR

(1) IDENTIFICATION AND DIRECTION OF PHOTOGRAPHY TAKEN DURING THE ANNUAL INSPECTION OF 2020

NOTE

GRID REFERENCE: NAD 83, UTM ZONE 14.

REFERENCE

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CONFIDENTIAL

0 50 100
1:2 500 METRES

CLIENT
AGNICO EAGLE

CONSULTANT
GOLDER

YYYY-MM-DD	2020-10-21
DESIGNED	R. Gravel
PREPARED	M. Habersetzer
REVIEWED	M. Habersetzer
APPROVED	Y. Boulianne

PROJECT
2020 ANNUAL GEOTECHNICAL INSPECTION
MEADOWBANK GOLD MINE, NUNAVUT

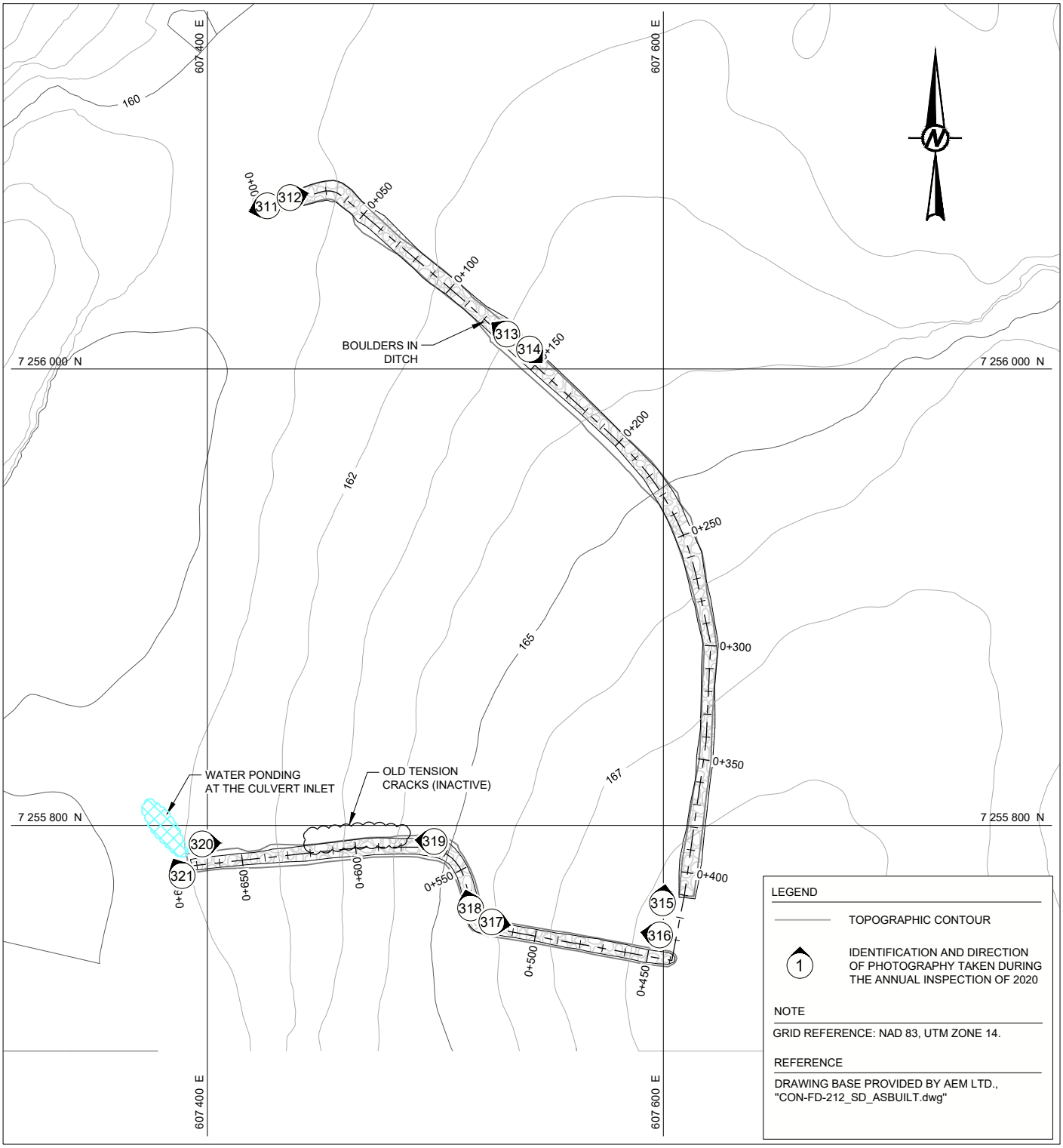
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SOUTH WHALE TAIL CHANNEL DURING THE ANNUAL INSPECTION OF 2020

PROJECT NO.	PHASE	REV.	FIGURE
20144230	5000	0	C5

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM ANSI B

25 mm

Path: \\golder.gds\gal\Montreal\SIG\CAD\PROJETS\AGNICO-EAGLE\AMARUQ\CAD\PRODUCTION\20144230\5000\ | File Name: 20144230-5000-01.dwg | Last Edited By: jarroub Date: 2020-12-23 Time:10:24:25 AM | Printed By: jArroub Date: 2020-12-23 Time:10:37:48 AM



CONFIDENTIAL

0 50 100
1:2 500 METRES

CLIENT
AGNICO EAGLE

CONSULTANT
GOLDER

YYYY-MM-DD	2020-10-21
DESIGNED	R. Gravel
PREPARED	M. Habersetzer
REVIEWED	M. Habersetzer
APPROVED	Y. Boulianne

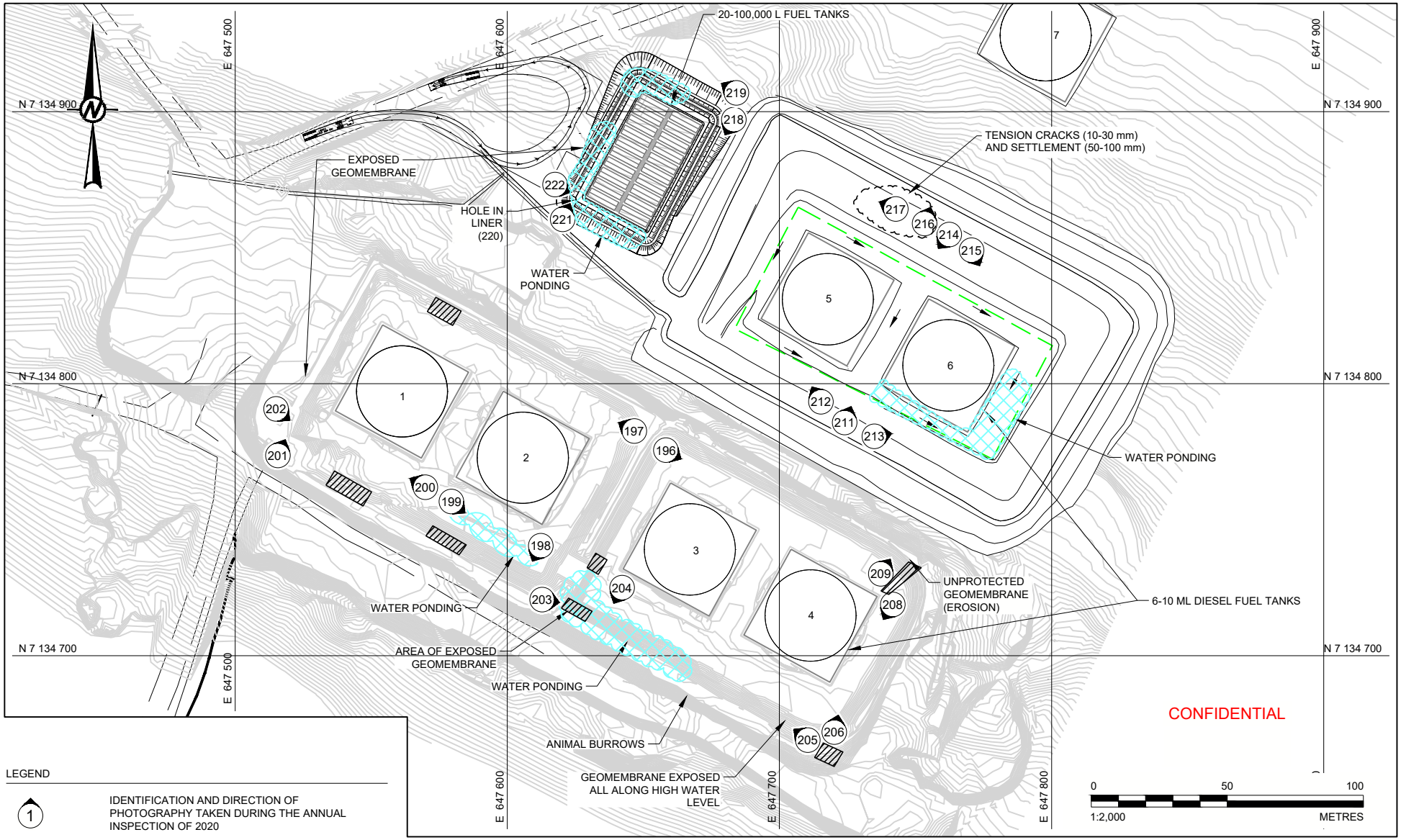
PROJECT
2020 ANNUAL GEOTECHNICAL INSPECTION
MEADOWBANK GOLD MINE, NUNAVUT

TITLE
SALINE DITCH DURING THE ANNUAL INSPECTION OF 2020

PROJECT NO.	PHASE	REV.	FIGURE
20144230	5000	0	C6

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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
25 mm
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LEGEND

1 — IDENTIFICATION AND DIRECTION OF PHOTOGRAPHY TAKEN DURING THE ANNUAL INSPECTION OF 2020

EXPOSED GEOSYNTHETICS

NOTE

GRID REFERENCE: NAD 83, UTM ZONE 14.

REFERENCE

BASE PLAN PROVIDED BY AEM LTD. IN "PORTAGE_GOOSE_VAULT_END2019_LOM2013_V4D-WITH LABEL.dwg, RECEIVED OCTOBER 7, 2013

CLIENT

AGNICO EAGLE

CONSULTANT

GOLDER

YYYY-MM-DD	2020-10-20
PREPARED	M. Habersetzer
DESIGN	R. Gravel
REVIEW	M. Habersetzer
APPROVED	Y. Boulianne

PROJECT

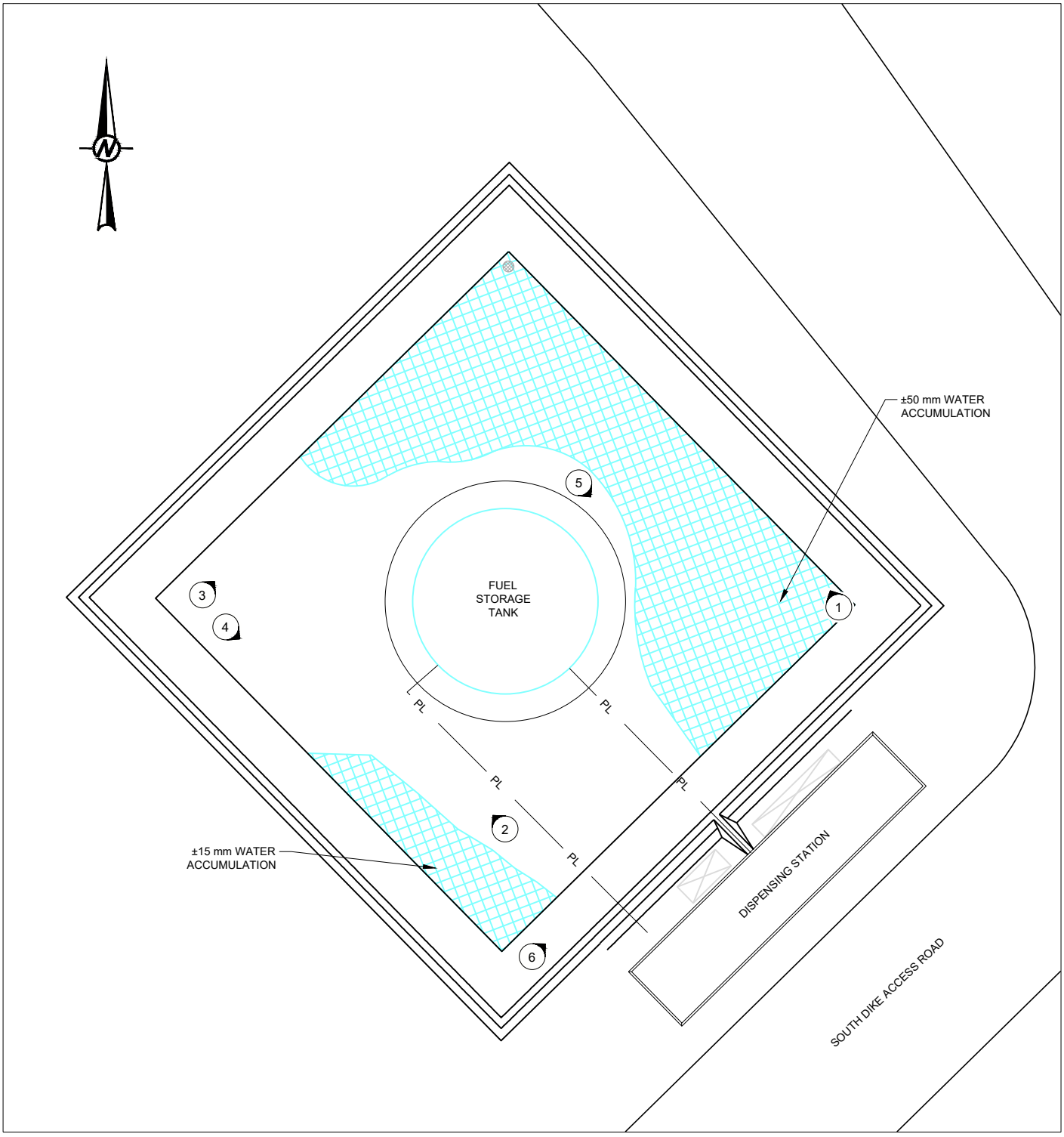
2020 ANNUAL GEOTECHNICAL INSPECTION
MEADOWBANK GOLD MINE, NUNAVUT

TITLE

BAKER LAKE TANK FARM DURING THE ANNUAL INSPECTION OF 2020

PROJECT No.	PHASE	Rev.	FIGURE
20144230	5000	0	G1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A
0 25 mm



LEGEND

1 IDENTIFICATION AND DIRECTION OF PHOTOGRAPHY TAKEN DURING THE ANNUAL INSPECTION OF 2020

REFERENCE

BASE PLAN INFORMATIONS IS PROVIDED BY CUMBERLAND DATED FEBRUARY 03, 2008

CONFIDENTIAL

0 12.5 25
1:750 METRES

CLIENT

AGNICO EAGLE

CONSULTANT

GOLDER

YYYY-MM-DD	2020-10-20
PREPARED	M. Habersetzer
DESIGN	R. Gravel
REVIEW	M. Habersetzer
APPROVED	Y. Boulianne

PROJECT

2020 ANNUAL GEOTECHNICAL INSPECTION
MEADOWBANK GOLD MINE, NUNAVUT

TITLE

MEADOWBANK TANK FARM DURING THE ANNUAL INSPECTION OF 2020

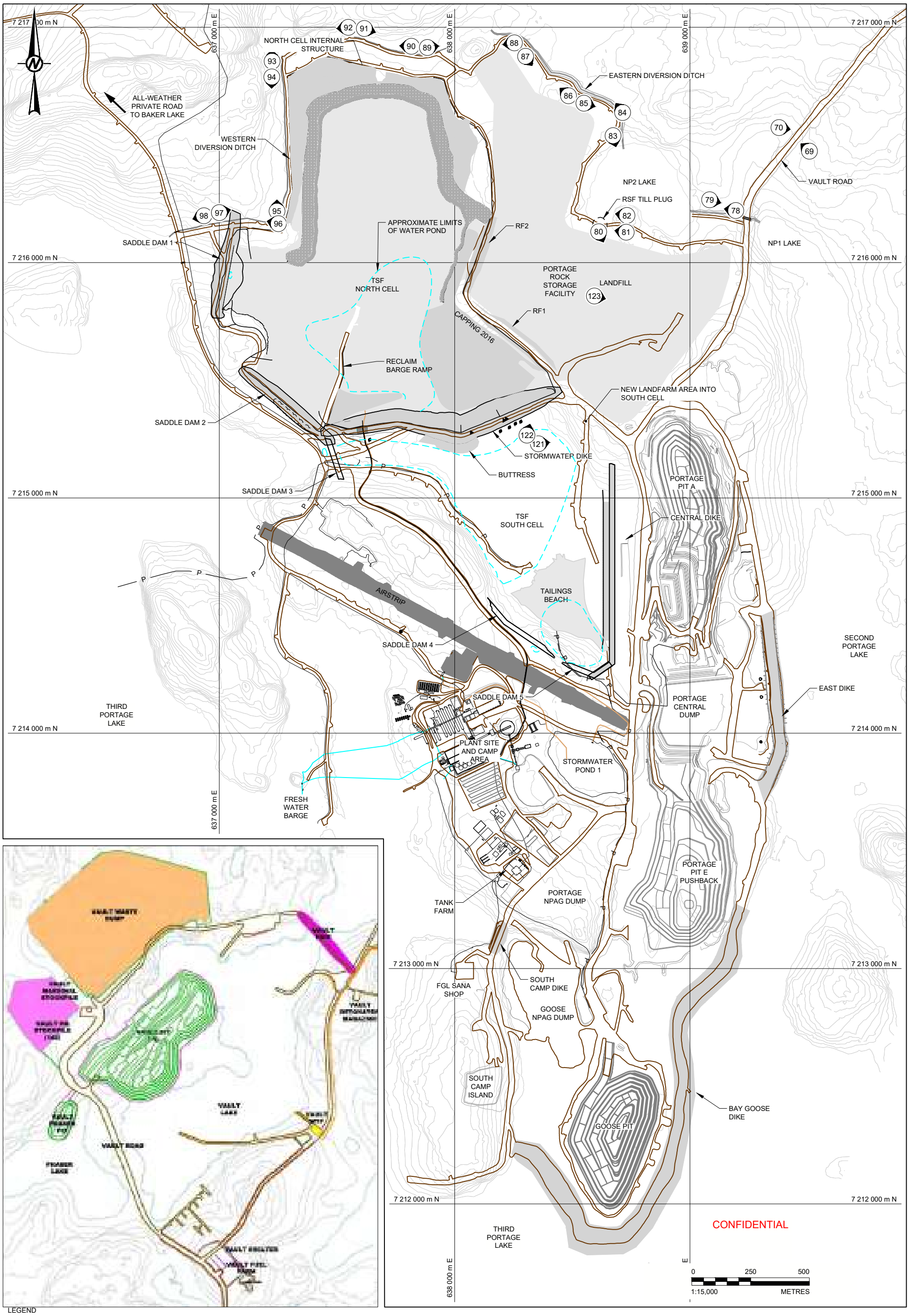
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IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI A

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LEGEND

TOPOGRAPHIC CONTOUR

1 IDENTIFICATION AND DIRECTION OF PHOTOGRAPHY TAKEN DURING THE ANNUAL INSPECTION OF 2020

NOTE

GRID REFERENCE: NAD 83, UTM ZONE 14.

REFERENCE

DRAWING BASE PROVIDED BY AEM LTD., MEADOWBANK DIVISION IN “MBK Site map updated JULY 2014.dwg” DATED JULY 8, 2014.

CLIENT

CONSULTANT

GOLDER

YYYY-MM-DD	2020-10-20
PREPARED	M. Habersetzer
DESIGN	R. Gravel
REVIEW	M. Habersetzer
APPROVED	Y. Boulianne

PROJECT

2020 ANNUAL GEOTECHNICAL INSPECTION
MEADOWBANK GOLD MINE, NUNAVUT

TITLE

MEADOWNBANK MINE SITE DURING THE ANNUAL INSPECTION OF 2020

PROJECT No.	PHASE	Rev.	FIGURE
20144230	5000	0	H1

IF THIS MEASUREMENT DOES NOT MATCH WHAT IS SHOWN, THE SHEET SIZE HAS BEEN MODIFIED FROM: ANSI B

25 mm

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APPENDIX A

Dewatering Dikes

APPENDIX A1

East Dike

Client:	AEM	**By:**	Marion Habersetzer
Project:	Meadowbank	**Date:**	July 14, 2020
Location:	East Dike	**Reviewed:**	Yves Boulianne

GENERAL INFORMATION			
Dam Type:	Rockfill embankment with a soil bentonite cut-off wall and downstream filters		
Weather Conditions:	Sunny	**Temperature:**	15°C

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1. DAM CREST		58, 59, 60, 61, 62, 67	
1.1 Crest elevation	136.5 m Cut-off 136.1m		Design thermal cap crest revised in 2011 to El. 136.5 m (Golder 2011)
1.2 Reservoir level	133.08 m U/S		
Current freeboard	3.02 m		Design 2 m.
1.3 Distance to tailings pond (if applicable)	Not applicable		
1.4 Surface cracking	Tension crack (approx. 3 m in length) around Sta. 60+480 m, inactive and completely healed.		
1.5 Unexpected settlement	None		
1.6 Lateral movement	Not apparent		
1.7 Other unusual conditions	None		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
2. UPSTREAM SLOPE		57, 58, 60, 61, 67	
2.1 Slope angle	Approx. 1.6H:1V		
2.2 Signs of erosion	Stable		
2.3 Signs of movement (deformation)	None observed		
2.4 Cracks	None observed		
2.5 Face liner condition (if applicable)	Not applicable		
2.6 Other unusual conditions	None		
3. DOWNSTREAM SLOPE		63, 65, 66	
3.1 Slope angle	Approx.1.6H:1V		
3.2 Signs of erosion	None observed		
3.3 Signs of movement (deformation)	None observed		
3.4 Cracks	None observed		
3.5 Seepage or wet areas	Not apparent		
3.6 Vegetation growth	None observed		
3.7 Other unusual conditions	None		
4. DOWNSTREAM TOE AREA		63, 64, 65, 66	
4.1 Seepage from dam	Yes, presence of 3 zones		Zone of seepage downstream near Sta. 60+247. A sump is installed (pumping system located in container on the photo). No additional seepage observed at the surface of the ground. Pumping collection system started on April 4, 2012. Flow is being monitored since July 2013.

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
			Zone of seepage downstream near Sta. 60+498. A sump is installed (pumping system located in container on the photo). Ponded water nearby. No additional seepage observed at the surface of the ground during the inspection. Pumping collection system started on April 4, 2012. Flow is being monitored since July 2013.
			Seepage zone near Sta. 60+575. According to AEM, this zone was practically dry all year. Water ponding was observed during inspection but no flow was noticed.
4.2 Signs of erosion	Not observed		
4.3 Signs of turbidity in seepage water	Not observed		Based on AEM's monthly report: seepage pumped into Portage Pit instead of Second Portage Lake after June 5th 2020 due to high TSS criteria. This is usual for the freshet season.
4.4 Discoloration/staining	No		
4.5 Outlet operating problem (if applicable)	Not applicable		
4.6 Other unusual conditions	None		
5. ABUTMENTS			
5.1 Seepage at contact zone (abutment/embankment)	None observed		
5.2 Signs of erosion	None observed		
5.3 Excessive vegetation	No		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
5.4 Presence of rodent burrows	None observed		
5.5 Other unusual conditions	None		
6. RESERVOIR			
6.1 Stability of slopes	Stable		Low relief region, stable upstream and downstream of dike. Portage Pit is on the downstream side of the dike.
6.2 Distance to nearest slide (if applicable)	None observed		
6.3 Estimate of slide volume (if applicable)	Not applicable		
6.4 Floating debris	None observed		
6.5 Other unusual conditions	None		
7. EMERGENCY SPILLWAY/ OUTLET STRUCTURE			
7.1 Surface condition	No spillway or outlet structure exists, only dewatering pump		
7.2 Signs of erosion			
7.3 Signs of movement (deformation)			
7.4 Cracks			
7.5 Settlement			
7.6 Presence of debris or blockage			

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
7.7 Closure mechanism operational			
7.8 Slope protection			
7.9 Instability of side slopes			
7.10 Other unusual conditions	No		
8. Instrumentation			
8.1 Piezometers	Yes		See Section 3.1.2 of the report.
8.2 Settlement cells	No		
8.3 Thermistors	Yes		No data after June 2016. See Section 3.1.2 of the report.
8.4 Settlement monuments	Not anymore		They have been removed in the past.
8.5 Seismograph	Periodic		See Section 3.1.2 of the report.
8.6 Inclinometer	Yes		See Section 3.1.2 of the report
8.7 Weirs and flow monitors	Yes		Flow meters are installed for the two pumping systems downstream. The flow of the seepage zone at Sta. 60+575 is measured using a pipe.
8.8 Data logger(s)	Yes		The piezometers and thermistors on East Dike have automatic data collection since June 2012 (data transmitted every 3 hours).
8.9 Other			
9. DOCUMENTATION			
9.1 Operation, Maintenance and Surveillance (OMS) Plan			
9.1.1 OMS Plan exists	Yes		
9.1.2 OMS Plan reflects current dam conditions	Yes		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
9.1.3 Date of last revision	March 2019		
9.2 Emergency Preparedness Plan (EPP)			
9.2.1 EPP exists	Yes		
9.2.2 EPP reflects current conditions	Yes		
9.2.3 Date of last revision	June 2020		
10. NOTES			

Inspector's Signature	Marion Habersetzer	**Date:**	July 14, 2020



Photograph A1-1 East Dike

Date: July 14, 2020 **Photo Number**: 62

Description: From approximately Sta. 60+450, looking north at the crest.



Photograph A1-2 East Dike

Date: July 14, 2020 **Photo Number**: 59

Description: From approximately Sta. 60+450, looking south at the crest.



Photograph A1-3 East Dike

Date: July 14, 2020 **Photo Number**: 60

Description: From approximately Sta. 60+450 upstream, looking south at the crest.



Photograph A1-4 East Dike

Date: July 14, 2020 **Photo Number**: 61

Description: From approximately Sta. 60+450 upstream, looking north at the crest.



Photograph A1-5 East Dike

Date: July 14, 2020 **Photo Number**: 67

Description: From approximately Sta. 60+810, looking south at the crest and upstream slope.



Photograph A1-6 East Dike

Date: July 14, 2020 **Photo Number**: 58

Description: From Sta. 60+300 upstream, looking north at the crest and upstream slope.



Photograph A1-7 East Dike

Date: July 14, 2020 **Photo Number**: 57

Description: From approximately Sta. 60+250 upstream, looking south at the upstream slope.



Photograph A1-8 East Dike

Date: July 14, 2020 **Photo Number**: 56

Description: From approximately Sta. 60+250, looking west at the downstream side and toe.



Photograph A1-9 East Dike

Date: July 14, 2020 **Photo Number**: 64

Description: From approximately Sta. 60+475, looking south at the downstream toe.



Photograph A1-10 East Dike

Date: July 14, 2020 **Photo Number**: 63

Description: From approximately Sta. 60+560, looking north at the downstream toe.



Photograph A1-11 East Dike

Date: July 14, 2020 **Photo Number**: 66

Description: From approximately Sta. 60+560, looking south at the downstream toe.



Photograph A1-12 East Dike

Date: July 14, 2020 **Photo Number**: 65

Description: From approximately Sta. 60+560, looking north at the downstream slope and toe.

APPENDIX A2

South Camp Dike

Client:	AEM	**By:**	Marion Habersetzer
Project:	Meadowbank	**Date:**	July 14, 2020
Location:	South Camp Dike	**Reviewed:**	Yves Boulianne

GENERAL INFORMATION			
Dam Type:	Rockfill shell with upstream filter, a bituminous geomembrane liner and protective cover.		
Weather Conditions:	Sunny	**Temperature:**	15°C

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1. DAM CREST		8, 11, 12, 13	
1.1 Crest elevation	El. 136.6 m (rockfill) El. 134.7 m (liner)		
1.2 Reservoir level	U/S El.133.7 m D/S		No water observed at downstream toe since 2011, except periodic run-off.
Current freeboard	2.9 m (rockfill crest) 1.0 m (liner crest)		
1.3 Distance to tailings pond (if applicable)	Not applicable		
1.4 Surface cracking	None at the time of inspection		
1.5 Unexpected settlement	None at the time of inspection		
1.6 Lateral movement	Not apparent		
1.7 Other unusual conditions	None		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
2. UPSTREAM SLOPE		10, 11	
2.1 Slope angle	Approx. 1.3H: 1V		Adequate
2.2 Signs of erosion	None observed		
2.3 Signs of movement (deformation)	None observed		
2.4 Cracks	None observed		
2.5 Face liner condition (if applicable)	Liner not visible at the time of the inspection		Bituminous geomembrane liner. Compacted granular material mixed with bentonite was placed above the liner, followed by a thermal cap layer covering the entire liner face.
2.6 Other unusual conditions	None		
3. DOWNSTREAM SLOPE		9, 13	
3.1 Slope angle	Approx. 1.4H:1V		Adequate
3.2 Signs of erosion	None observed		
3.3 Signs of movement (deformation)	None observed		
3.4 Cracks	None observed		
3.5 Seepage or wet areas	None observed.		
3.6 Vegetation growth	No		
3.7 Other unusual conditions	None		
4. DOWNSTREAM TOE AREA		9, 13	
4.1 Seepage from dam	Accumulation of run-off water.		Very little water ponding compared to 2019. No sign of flow.
4.2 Signs of erosion	None observed		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
4.3 Signs of turbidity in seepage water	None		
4.4 Discoloration/staining	No		
4.5 Outlet operating problem (if applicable)	Not applicable		
4.6 Other unusual conditions	None		
5. ABUTMENTS			
5.1 Seepage at contact zone (abutment/embankment)	None observed		
5.2 Signs of erosion	None observed		
5.3 Excessive vegetation	No		
5.4 Presence of rodent burrows	None observed		
5.5 Other unusual conditions	None		
6. RESERVOIR			
6.1 Stability of slopes	Stable		
6.2 Distance to nearest slide (if applicable)	Not applicable		
6.3 Estimate of slide volume (if applicable)	None observed		
6.4 Floating debris	None		
6.5 Other unusual conditions	None		
7. EMERGENCY SPILLWAY/ OUTLET STRUCTURE			

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
7.1 Surface condition	No spillway or outlet structure exists		
7.2 Signs of erosion			
7.3 Signs of movement (deformation)			
7.4 Cracks			
7.5 Settlement			
7.6 Presence of debris or blockage			
7.7 Closure mechanism operational			
7.8 Slope protection			
7.9 Instability of side slopes			
7.10 Other unusual conditions			
8. INSTRUMENTATION			
8.1 Piezometers	No		
8.2 Settlement cells	No		
8.3 Thermistors	Yes		Section 3.2.2 of the report describes the thermal condition.
8.4 Settlement monuments	No		
8.5 Seismograph	No		
8.6 Inclinometer	No		
8.7 Weirs and flow monitors	No		
8.8 Data logger(s)	Yes		
8.9 Other	No		
9. DOCUMENTATION			

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
9.1 Operation, Maintenance and Surveillance (OMS) Plan			
9.1.1 OMS Plan exists	Yes		
9.1.2 OMS Plan reflects current dam conditions	Yes		
9.1.3 Date of last revision	March 2019		
9.2 Emergency Preparedness Plan (EPP)			
9.2.1 EPP exists	Yes		
9.2.2 EPP reflects current conditions	Yes		
9.2.3 Date of last revision	June 2020		
10. NOTES			
Inspector's Signature	Marion Habersetzer	**Date:**	July 14, 2020



Photograph A2-1 South Camp Dike

Date: July 14, 2020 **Photo Number**: 11

Description: From the south abutment, looking north at the upstream slope and the thermistors instrumentation set-up.



Photograph A2-2 South Camp Dike

Date: July 14, 2020 **Photo Number**: 10

Description: From the north abutment, looking south at the upstream slope and thermistors instrumentation set-up.



Photograph A2-3 South Camp Dike

Date: July 14, 2020 **Photo Number**: 12

Description: From the south abutment, looking north at the crest.



Photograph A2-4 South Camp Dike

Date: July 14, 2020 **Photo Number**: 8

Description: From the north abutment, looking south at the crest.



Photograph A2-5 South Camp Dike

Date: July 14, 2020 **Photo Number**: 9

Description: From the north abutment, looking south at the downstream slope. There is very little water ponding, from run-off.



Photograph A2-6 South Camp Dike

Date: July 14, 2020 **Photo Number**: 13

Description: From the south abutment, looking north at the downstream slope. There is very little water ponding, from run-off.

APPENDIX A3

Bay-Goose Dike

Client:	AEM	**By:**	Marion Habersetzer
Project:	Meadowbank	**Date:**	July 14, 2020
Location:	Bay-Goose Dike	**Reviewed:**	Yves Boulianne

GENERAL INFORMATION			
Dam Type:	Rockfill embankment with a cut-off wall (soil-bentonite, cement-soil-bentonite and jet grouting columns) and downstream filters		
Weather Conditions:	Sunny	**Temperature:**	15°C

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1. DAM CREST		15, 16, 17, 19, 20, 21, 22, 24, 25, 26, 27, 29, 30, 31, 32, 33, 24, 37, 38, 47, 48, 53, 54	
1.1 Crest elevation	+/-138 cut-off 136.1m		Thermal cap completed in May 2013.
1.2 Reservoir level	133.7 m upstream		Downstream side dewatered since mid-November 2011.
Current freeboard	2.4 m		Design 2.0 m.
1.3 Distance to tailings pond (if applicable)	Not applicable		
1.4 Surface cracking	Yes		The tension cracks observed in 2013 on the upstream side within the thermal cap placed during winter 2013 are still visible but are no longer active.

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1.5 Unexpected settlement	Yes		The rockfill cap added over the cut-off in the winter of 2013 is showing settlement all along the upstream side of the dike and over the cut-off. Settlement varies from 0.1 m to > 1 m. No longer active.
1.6 Lateral movement	Not apparent		
1.7 Other unusual conditions	Yes		
2. UPSTREAM SLOPE		21, 22, 39, 40, 47, 48, 53, 54	
2.1 Slope angle	Approx. 1.6H:1V		Rockfill
2.2 Signs of erosion	Stable		
2.3 Signs of movement (deformation)	None observed		
2.4 Cracks	None observed		
2.5 Face liner condition (if applicable)	Not applicable		
2.6 Other unusual conditions	None		
3. DOWNSTREAM SLOPE		17, 18, 19, 20, 23, 24, 28, 29, 30, 35, 36, 41, 42, 43, 44, 45, 46, 49, 50, 51, 52	
3.1 Slope angle	Approx.1.6H:1V		
3.2 Signs of erosion	None observed		
3.3 Signs of movement (deformation)	None observed		
3.4 Cracks	None observed		
3.5 Seepage or wet areas	Not apparent		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
3.6 Vegetation growth	None observed		
3.7 Other unusual conditions	None		
4. DOWNSTREAM TOE AREA		17, 18, 23, 24, 28, 29, 30, 35, 36, 41, 42, 43, 44, 45, 46, 49, 50, 51, 52	
4.1 Seepage from dike	Yes		Seepage zone observed as well as water pond. The seepage is being monitored by the mine and does not show signs of aggravation.
	North Channel	50, 51	Monitored by stations 8 (30+420) and 9 (30+380). Water flowing was observed during the inspection.
	Central Shallow		Presence of 2 seepage channels at 30+650 and 30+625. Flow was observed during inspection at 30+650. Monitored by station 7.
	Central Channel	42	Presence of a seepage channel at Sta. 31+165. Water ponding was observed at the time of the inspection. It was pumped once after freshet only.
	Channel 3	23, 25, 28	Light flow observed during inspection. Monitored by station 6.
	Channel 1	43, 46	This seepage channel was not flowing at the time of the inspection.
	Water Ponds	24	Presence of water pond with no sign of seepage. Located at 31+750. Water was observed downstream of Channel 1 ponding against the ring road of Goose Pit.
4.2 Signs of erosion	None observed		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
4.3 Signs of turbidity in seepage water	No.		
4.4 Discoloration/staining	No		
4.5 Outlet operating problem (if applicable)	Not applicable		
4.6 Other unusual conditions	Yes		Inflow of water on pit wall. Probably due to the Bay-Goose fault and rock quality. In the vicinity of Channels 1, 2 and 3. Not monitored anymore.
5. ABUTMENTS			
5.1 Seepage at contact zone (abutment/embankment)	None observed		
5.2 Signs of erosion	None observed		
5.3 Excessive vegetation	No		
5.4 Presence of rodent burrows	None observed		
5.5 Other unusual conditions	None		
6. RESERVOIR		25, 39, 40	
6.1 Stability of slopes	Stable		
6.2 Distance to nearest slide (if applicable)	None observed		
6.3 Estimate of slide volume (if applicable)	Not applicable		
6.4 Floating debris	None observed		
6.5 Other unusual conditions	None		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
7. EMERGENCY SPILLWAY/ OUTLET STRUCTURE			
7.1 Surface condition	No spillway or outlet structure exists, only dewatering pump.		
7.2 Signs of erosion			
7.3 Signs of movement (deformation)			
7.4 Cracks			
7.5 Settlement			
7.6 Presence of debris or blockage			
7.7 Closure mechanism operational			
7.8 Slope protection			
7.9 Instability of side slopes			
7.10 Other unusual conditions			
8. INSTRUMENTATION			
8.1 Piezometers	Yes		See Section 3.3.2 of the report.
8.2 Settlement cells	No		
8.3 Thermistors	Yes		See Section 3.3.2 of the report.
8.4 Settlement monuments	No		Survey monuments removed in the past.
8.5 Seismograph	Periodic		See Section 3.3.2 of the report.
8.6 Inclinometer	Yes		See Section 3.3.2 of the report.
8.7 Weirs and flow monitors	Yes		Seepage monitoring system installed at seepage channel to monitor flow.

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
8.8 Data logger(s)	Yes		The piezometers and the thermistors have automatic data transmission (every 3 hours).
8.9 Other			
9. DOCUMENTATION			
9.1 Operation, Maintenance and Surveillance (OMS) Plan			
9.1.1 OMS Plan exists	Yes		
9.1.2 OMS Plan reflects current dam conditions	Yes		
9.1.3 Date of last revision	March 2019		
9.2 Emergency Preparedness Plan (EPP)			
9.2.1 EPP exists	Yes		
9.2.2 EPP reflects current conditions	Yes		
9.2.3 Date of last revision	June 2020		
10. NOTES			

Inspector's Signature	Marion Habersetzer	**Date:**	July 14, 2020



Photograph A3-1 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 53

Description: From approximately Sta. 30+142 (north abutment) looking southwest at the crest and upstream slope.



Photograph A3-2 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 54

Description: From approximately Sta. 30+130 (north abutment), looking north at the crest and upstream slope.



Photograph A3-3 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 52

Description: From approximately Sta. 30+340 on the crest, looking northeast at the dam crest and downstream slope



Photograph A3-4 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 51

Description: From approximately Sta. 30+340, looking northwest at the north seepage channel.



Photograph A3-5 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 50

Description: From approximately Sta. 30+450, looking north at the downstream slope.



Photograph A3-6 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 48

Description: From Sta. 30+500, looking northeast at the crest and the upstream slope.



Photograph A3-7 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 47

Description: From Sta. 30+500, looking south at the crest and the upstream slope.



Photograph A3-8 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 49

Description: From Sta. 30+500, looking west at the downstream slope and toe.



Photograph A3-9 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 39

Description: From approximately Sta. 31+130, looking south at the upstream slope.



Photograph A3-10 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 40

Description: From approximately Sta. 31+130, looking north at the crest and upstream slope.



Photograph A3-11 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 41

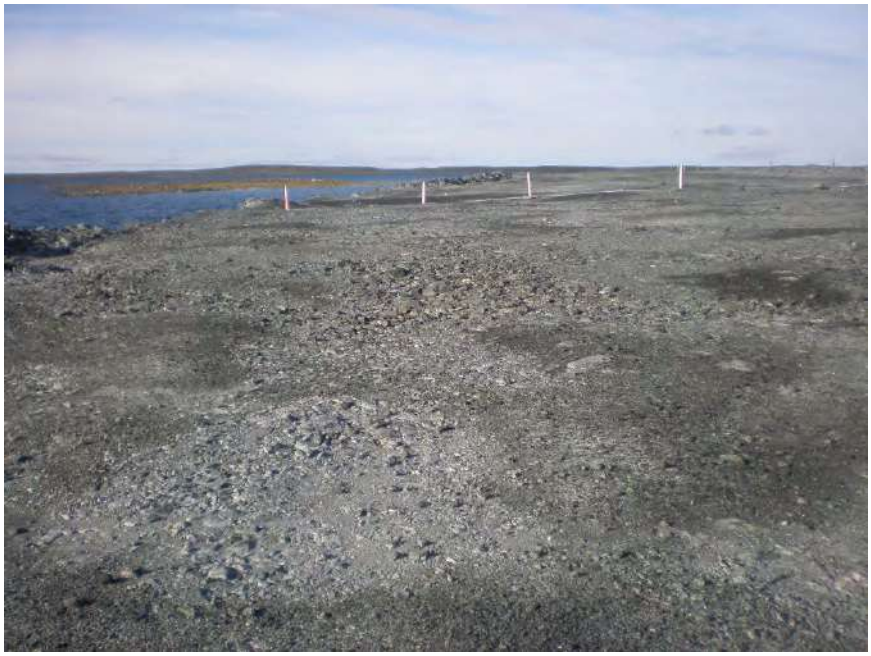
Description: From approximately Sta. 31+080 on the crest, looking north at the downstream slope and toe.



Photograph A3-12 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 42

Description: From approximately Sta. 31+080 on the crest, looking southwest at the pond of water at Central Channel seepage at Sta. 31+165.



Photograph A3-13 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 37

Description: From approximately Sta. 31+130, looking southwest at the crest.



Photograph A3-14 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 38

Description: From approximately Sta. 31+130, looking north at the crest.



Photograph A3-15 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 36

Description: From approximately Sta. 31+280 on the crest, looking north at the downstream slope and toe area.



Photograph A3-16 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 35

Description: From approximately Sta. 31+280 on the crest, looking southwest at the downstream slope and the water pond at the downstream toe at Sta. 31+350.



Photograph A3-17 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 34

Description: From approximately Sta. 31+280, looking south at the crest.



Photograph A3-18 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 33

Description: From approximately Sta. 31+280, looking northeast at the crest.



Photograph A3-19 Bay Goose Dike

Date: July 14, 2020 **Photo Number:** 31

Description: From approximately Sta. 31+475, looking west at the crest. Old cracks are disappearing.



Photograph A3-20 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 32

Description: From approximately Sta. 31+475, looking northeast at the crest. Old cracks are disappearing.



Photograph A3-21 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 30

Description: From approximately Sta. 31+475, looking east at the crest and the downstream slope.



Photograph A3-22 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 29

Description: From approximately Sta. 31+475, looking west at the crest and the downstream slope toward Channel 3.



Photograph A3-23 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 28

Description: From approximately Sta. 31+570, looking north toward Channel 3.



Photograph A3-24 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 27

Description: From approximately Sta. 31+645, looking east at the crest.



Photograph A3-25 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 26

Description: From approximately Sta. 31+645, looking northwest at the crest.



Photograph A3-26 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 25

Description: From approximately Sta. 31+640, looking southeast at the upstream slope.



Photograph A3-27 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 23

Description: From the crest at approximately Sta. 31+740. Looking southeast downstream toward Channel 3.



Photograph A3-28 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 24

Description: From the crest at approximately Sta. 31+740, looking north downstream at the water pond at Sta. 31+750.



Photograph A3-29 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 21

Description: From approximately Sta. 31+870, looking northwest at the crest and upstream slope.



Photograph A3-30 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 22

Description: From approximately Sta. 31+870, looking southeast at the crest and upstream slope.



Photograph A3-31 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 19

Description: From approximately Sta. 31+920, looking south at the crest.



Photograph A3-32 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 20

Description: From approximately Sta. 31+920, looking northwest at the crest.



Photograph A3-33 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 44

Description: From approximately Sta. 31+920, looking southeast at the downstream slope and toe.



Photograph A3-34 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 43

Description: From about Sta. 31+920, looking northwest at the downstream slope and toe toward Channel 1 monitoring station.



Photograph A3-35 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 17

Description: From approximately Sta. 32+030 looking southeast at the crest and downstream slope.



Photograph A3-36 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 18

Description: From approximately Sta. 32+030 looking southwest at the downstream slope.



Photograph A3-37 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 45

Description: From approximately Sta. 32+030 downstream, looking northwest at the downstream slope.



Photograph A3-38 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 46

Description: From approximately Sta. 32+030 downstream, looking southeast at the downstream slope and toe.



Photograph A3-39 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 16

Description: From approximately Sta. 32+025 (south abutment) looking east at the crest. Zone of high magnitude settlement in the ultramafic cap. The tension cracks seem no longer active.



Photograph A3-40 Bay Goose Dike

Date: July 14, 2020 **Photo Number**: 15

Description: From approximately Sta. 32+025 (south abutment) looking west at the crest. Zone of high magnitude settlement in the ultramafic cap. The tension cracks seem no longer active.

APPENDIX A4

Vault Dike

Client:	AEM	**By:**	Marion Habersetzer
Project:	Meadowbank	**Date:**	July 14, 2020
Location:	Vault Dike	**Reviewed:**	Yves Boulianne

GENERAL INFORMATION			
Dam Type:	Rockfill embankment with filter zones, impervious upstream liner (bituminous membrane) and an upstream key trench (aggregate mixed with bentonite)		
Weather Conditions:	Sunny	**Temperature:**	15°C

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1. DAM CREST		71, 72, 73, 74, 75, 76	
1.1 Crest elevation	142.4 m		
1.2 Reservoir level	139.64 m U/S		
Current freeboard	2.76 m		
1.3 Distance to tailings pond (if applicable)	Not applicable		
1.4 Surface cracking	No		
1.5 Unexpected settlement	No		
1.6 Lateral movement	Not apparent		
1.7 Other unusual conditions	No		
2. UPSTREAM SLOPE		72, 76	
2.1 Slope angle	Approx. 1.5H:1V		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
2.2 Signs of erosion	Stable		
2.3 Signs of movement (deformation)	None observed		
2.4 Cracks	No		
2.5 Face liner condition (if applicable)	Not applicable		
2.6 Other unusual conditions	None		
3. DOWNSTREAM SLOPE		71, 73, 74	
3.1 Slope angle	Approx.1.5H:1V		
3.2 Signs of erosion	None observed		
3.3 Signs of movement (deformation)	No		
3.4 Cracks	None observed		
3.5 Seepage or wet areas	Not apparent		
3.6 Vegetation growth	None observed		
3.7 Other unusual conditions	None		
4. DOWNSTREAM TOE AREA			
4.1 Seepage from dam	None		
4.2 Signs of erosion	Not observed		
4.3 Signs of turbidity in seepage water	No		
4.4 Discoloration/staining	No		
4.5 Outlet operating problem (if applicable)	Not applicable		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
4.6 Other unusual conditions	None		
5. ABUTMENTS			
5.1 Seepage at contact zone (abutment/embankment)	None observed		
5.2 Signs of erosion	None observed		
5.3 Excessive vegetation	No		
5.4 Presence of rodent burrows	None observed		
5.5 Other unusual conditions	None		
6. RESERVOIR			
6.1 Stability of slopes	Good conditions		
6.2 Distance to nearest slide (if applicable)	None observed		
6.3 Estimate of slide volume (if applicable)	Not applicable		
6.4 Floating debris	None observed		
6.5 Other unusual conditions	None		
7. EMERGENCY SPILLWAY/ OUTLET STRUCTURE	No spillway or outlet structure exists, only dewatering pump.		
7.1 Surface condition			
7.2 Signs of erosion			
7.3 Signs of movement (deformation)			

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
7.4 Cracks			
7.5 Settlement			
7.6 Presence of debris or blockage			
7.7 Closure mechanism operational			
7.8 Slope protection			
7.9 Instability of side slopes			
7.10 Other unusual conditions	No		
8. Instrumentation			
8.1 Piezometers	No		
8.2 Settlement cells	No		
8.3 Thermistors	Yes		See Section 3.4.2 of the report.
8.4 Settlement monuments	No		
8.5 Seismograph	No		
8.6 Inclinometer	No		
8.7 Weirs and flow monitors	No		
8.8 Data logger(s)	No		
8.9 Other			
9. DOCUMENTATION			
9.1 Operation, Maintenance and Surveillance (OMS) Plan			
9.1.1 OMS Plan exists	Yes		
9.1.2 OMS Plan reflects current dam conditions	Yes		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
9.1.3 Date of last revision	March 2019		
9.2 Emergency Preparedness Plan (EPP)			
9.2.1 EPP exists	Yes		
9.2.2 EPP reflects current conditions	Yes		
9.2.3 Date of last revision	June 2020		
10. NOTES			

Inspector's Signature	Marion Habersetzer	**Date:**	July 14, 2020



Photograph A4-1 Vault Dike

Date: July 14, 2020 **Photo Number**: 71

Description: From the east abutment, looking northwest at the crest.



Photograph A4-2 Vault Dike

Date: July 14, 2020 **Photo Number**: 74

Description: From downstream, looking southeast at the downstream toe.



Photograph A4-3 Vault Dike

Date: July 14, 2020 **Photo Number**: 73

Description: From downstream, looking northwest at the downstream toe.



Photograph A4-4 Vault Dike

Date: July 14, 2020 **Photo Number**: 75

Description: From the west abutment, looking southeast at the crest.



Photograph A4-5 Vault Dike

Date: July 14, 2020 **Photo Number**: 76

Description: From the upstream side, looking southeast at the upstream slope.



Photograph A4-6 Vault Dike

Date: July 14, 2020 **Photo Number**: 72

Description: From the upstream side, looking northwest at the upstream slope.

APPENDIX A5

Whale Tail Dike

Client:	AEM	**By:**	Marion Habersetzer
Project:	Whale Tail Project	**Date:**	July 20, 2020
Location:	Whale Tail Dike	**Reviewed:**	Yves Boulianne

GENERAL INFORMATION			
Dam Type:	Rockfill shell with cement-bentonite secant pile cut-off wall enclosed in fine and coarse filter layers. 10 m deep grout curtain in the bedrock in the western section of the dike. Downstream grout blanket at bedrock interface all along the dike.		
Weather Conditions:	Sunny	**Temperature:**	20°C

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1. DAM CREST		277, 278, 279, 280, 281, 282, 283, 284, 285, 287, 288, 289, 290, 291, 292, 293, 294, 295	
1.1 Crest elevation	El. 159 m (rockfill) El. 157 m (cut-off wall)		A 2 m rockfill termal cap covers the cut-off wall (cement-bentonite secant piles)
1.2 Reservoir level	U/S El.155.5 m (Whale Tail South)		Operational water level: 155.5 m
Current freeboard	3.5 m (rockfill crest) 1.5 m (cut-off wall)		
1.3 Distance to tailings pond (if applicable)	Not applicable		
1.4 Surface cracking	None at the time of inspection		
1.5 Unexpected settlement	None at the time of inspection		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1.6 Lateral movement	Not apparent		
1.7 Other unusual conditions	None		
2. UPSTREAM SLOPE		277, 282, 285, 287, 292, 293	
2.1 Slope angle	1.5H:1V(dike) 1.3H:1V (U/S berm)		Adequate
2.2 Signs of erosion	None observed		
2.3 Signs of movement (deformation)	None observed		
2.4 Cracks	None observed		
2.5 Face liner condition (if applicable)	Not applicable		
2.6 Other unusual conditions	None		
3. DOWNSTREAM SLOPE		279, 280, 284, 286, 289, 291, 295, 296, 297, 298, 300, 301, 302	
3.1 Slope angle	1.5H:1V(dike) 1.3H:1V (D/S berm)		Adequate
3.2 Signs of erosion	None observed		
3.3 Signs of movement (deformation)	None observed		
3.4 Cracks	None observed		
3.5 Seepage or wet areas	None observed.		
3.6 Vegetation growth	No		
3.7 Other unusual conditions	None		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
4. DOWNSTREAM TOE AREA		275, 276, 286, 297, 298, 299, 300, 301	
4.1 Seepage from dam	Yes		Collected in a trench from Sta. 0+430 to 0+720. Seepage interception system pumping water compose of 4 pumping stations.
4.2 Signs of erosion	None observed		
4.3 Signs of turbidity in seepage water	None		All seepage water is now clear
4.4 Discoloration/staining	No		
4.5 Outlet operating problem (if applicable)	Not applicable		
4.6 Other unusual conditions	None		
5. ABUTMENTS			
5.1 Seepage at contact zone (abutment/embankment)	None observed		
5.2 Signs of erosion	None observed		
5.3 Excessive vegetation	No		
5.4 Presence of rodent burrows	None observed		
5.5 Other unusual conditions	None		
6. RESERVOIR			
6.1 Stability of slopes	Stable		
6.2 Distance to nearest slide (if applicable)	Not applicable		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
6.3 Estimate of slide volume (if applicable)	None observed		
6.4 Floating debris	None		
6.5 Other unusual conditions	None		
7. EMERGENCY SPILLWAY/ OUTLET STRUCTURE	No spillway or outlet structure exists		
7.1 Surface condition			
7.2 Signs of erosion			
7.3 Signs of movement (deformation)			
7.4 Cracks			
7.5 Settlement			
7.6 Presence of debris or blockage			
7.7 Closure mechanism operational			
7.8 Slope protection			
7.9 Instability of side slopes			
7.10 Other unusual conditions			
8. INSTRUMENTATION			
8.1 Piezometers	Yes		9 piezometer holes with each 3 instruments. See Section 4.1.2 of the report
8.2 Settlement cells	No		
8.3 Thermistors	Yes		16 piezometers in the dike. See Section 4.1.2 of the report.

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
8.4 Settlement monuments	No		
8.5 Seismograph	No		
8.6 Inclinometer	Yes		4 shape array accelerometers. See Section 4.1.2 of the report.
8.7 Weirs and flow monitors	Yes		2 V-notch weirs (0+430 and 0+560)
8.8 Data logger(s)	Yes		
8.9 Other	No		
9. DOCUMENTATION			
9.1 Operation, Maintenance and Surveillance (OMS) Plan			
9.1.1 OMS Plan exists	Yes		
9.1.2 OMS Plan reflects current dam conditions	Yes		
9.1.3 Date of last revision	March 2019		
9.2 Emergency Preparedness Plan (EPP)			
9.2.1 EPP exists	Yes		
9.2.2 EPP reflects current conditions	Yes		
9.2.3 Date of last revision	January 2018		
10. NOTES			
Inspector's Signature	Marion Habersetzer	**Date:**	July 20, 2020



Photograph A5-1 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 275

Description: From approx. Sta. 0+250 downstream (P4 pumping station), looking east. A large amount of water is ponding.



Photograph A5-2 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 276

Description: From approx. Sta. 0+250 downstream (P3 pumping station), looking southeast. A water stream originating from seepage is bypassing the pumping station and a trench should be dug to redirect it to the sump.



Photograph A5-3 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 277

Description: From approx. Sta. 0+725 (east abutment), looking southwest at the upstream slope and the discharge line from the water treatment plant.



Photograph A5-4 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 278

Description: From approx. Sta. 0+725 (east abutment), looking west at the crest. Presence of cement on the surface from grouting operations.



Photograph A5-5 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 279

Description: From approx. Sta. 0+725 (east abutment), looking west at the downstream slope.



Photograph A5-6 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 282

Description: From approx. Sta. 0+575, looking west at the upstream slope.



Photograph A5-7 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 281

Description: From approx. Sta. 0+575, looking west at the crest. Presence of cement on the surface from grouting operations.



Photograph A5-8 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 280

Description: From approx. Sta. 0+575, looking west at the downstream slope and downstream platform.



Photograph A5-9 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 285

Description: From approx. Sta. 0+525, looking east at the upstream slope.



Photograph A5-10 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 283

Description: From approx. Sta. 0+525, looking east at the crest. Presence of cement on the surface from grouting operations.



Photograph A5-11 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 284

Description: From approx. Sta. 0+525, looking east at the downstream slope and downstream platform.



Photograph A5-12 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 286

Description: From approx. Sta. 0+475, looking north at the downstream platform and P3 pumping station.



Photograph A5-13 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 287

Description: From approx. Sta. 0+350, looking southwest at the upstream slope.



Photograph A5-14 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 288

Description: From approx. Sta. 0+350, looking southwest at the crest. Presence of cement on the surface from grouting operations.



Photograph A5-15 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 289

Description: From approx. Sta. 0+350, looking southwest at the downstream slope and downstream platform.



Photograph A5-16 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 292

Description: From approx. Sta. 0+350, looking northeast at the upstream slope.



Photograph A5-17 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 290

Description: From approx. Sta. 0+350, looking northeast at the crest. Presence of cement on the surface from grouting operations.



Photograph A5-18 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 291

Description: From approx. Sta. 0+350, looking northeast at the downstream slope and downstream platform.



Photograph A5-19 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 293

Description: From approx. Sta. 0+200 (west abutment), looking northeast at the upstream slope.



Photograph A5-20 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 294

Description: From approx. Sta. 0+200 (west abutment), looking northeast at the crest. Presence of cement on the surface from grouting operations.



Photograph A5-21 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 295

Description: From approx. Sta. 0+200 (west abutment), looking northeast at the downstream slope and downstream platform.



Photograph A5-22 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 296

Description: From approx. Sta. 0+200 on the downstream platform, looking northeast at the downstream slope and platform.



Photograph A5-23 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 297

Description: From approx. Sta. 0+300 on the downstream platform, looking southwest at the downstream slope and platform, and seepage area.



Photograph A5-24 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 298

Description: From approx. Sta. 0+300 on the downstream platform, looking northeast at the downstream slope and platform, and seepage area.



Photograph A5-25 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 299

Description: From approx. Sta. 0+400 downstream, looking north at the seepage collection trench and a V-notch.



Photograph A5-26 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 300

Description: From approx. Sta. 0+400 downstream, looking northeast at the seepage collection trench and downstream toe.



Photograph A5-27 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 301

Description: From approx. Sta. 0+500 downstream, looking west at the seepage collection trench and downstream toe.



Photograph A5-28 Whale Tail Dike

Date: July 20, 2020 **Photo Number**: 302

Description: From approx. Sta. 0+675 downstream, looking west at the downstream slope and platform.

APPENDIX A6

North-East Dike

Client:	AEM	**By:**	Marion Habersetzer
Project:	Whale Tail Project	**Date:**	July 21, 2020
Location:	North-East Dike	**Reviewed:**	Yves Boulianne

GENERAL INFORMATION			
Dam Type:	Rockfill shell with a bituminous geomembrane liner tied in a fine filter amended with bentonite and a protective cover		
Weather Conditions:	Sunny	**Temperature:**	20°C

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1. DAM CREST		322, 323, 324, 326, 327, 328, 329, 330, 331, 335, 336, 337	
1.1 Crest elevation	El. 157.5 m (rockfill) El. 156.7 m (liner)		
1.2 Reservoir level	U/S El.155.51 m (A47, West Leg) U/S El.155.56 m (A47, East Leg)		
Current freeboard	1.94 m (rockfill crest) 1.14 m (liner)		Operational water level: 155.5 m
1.3 Distance to tailings pond (if applicable)	Not applicable		
1.4 Surface cracking	Yes	329	Old cracks are disappearing.
1.5 Unexpected settlement	Yes		Settlement occurred in 2019.
1.6 Lateral movement	Not apparent		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1.7 Other unusual conditions	None	330, 331	Some boulders and overburden present on the crest of the East Leg from snow removal activities.
2. UPSTREAM SLOPE		324, 325, 326, 332, 333, 334	
2.1 Slope angle	2H: 1V		Adequate
2.2 Signs of erosion	None observed		
2.3 Signs of movement (deformation)	None observed		
2.4 Cracks	None observed		
2.5 Face liner condition (if applicable)	Not observed		Liner covered in a fine filter protection layer.
2.6 Other unusual conditions	None		
3. DOWNSTREAM SLOPE		322, 328, 330, 337, 338	
3.1 Slope angle	1.5H:1V		Adequate
3.2 Signs of erosion	None observed		
3.3 Signs of movement (deformation)	None observed		
3.4 Cracks	None observed		
3.5 Seepage or wet areas	None observed.		
3.6 Vegetation growth	No		
3.7 Other unusual conditions	None		
4. DOWNSTREAM TOE AREA		322, 328, 330, 337, 338	
4.1 Seepage from dam	None observed	328, 338	Water ponding at the toe. No flow observed.

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
4.2 Signs of erosion	None observed		
4.3 Signs of turbidity in seepage water	None		
4.4 Discoloration/staining	No		
4.5 Outlet operating problem (if applicable)	Not applicable		
4.6 Other unusual conditions	None		
5. ABUTMENTS			
5.1 Seepage at contact zone (abutment/embankment)	None observed		
5.2 Signs of erosion	None observed		
5.3 Excessive vegetation	No		
5.4 Presence of rodent burrows	None observed		
5.5 Other unusual conditions	None		
6. RESERVOIR			
6.1 Stability of slopes	Stable		
6.2 Distance to nearest slide (if applicable)	Not applicable		
6.3 Estimate of slide volume (if applicable)	None observed		
6.4 Floating debris	None		
6.5 Other unusual conditions	None		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
7. EMERGENCY SPILLWAY/ OUTLET STRUCTURE	No spillway or outlet structure exists		
7.1 Surface condition			
7.2 Signs of erosion			
7.3 Signs of movement (deformation)			
7.4 Cracks			
7.5 Settlement			
7.6 Presence of debris or blockage			
7.7 Closure mechanism operational			
7.8 Slope protection			
7.9 Instability of side slopes			
7.10 Other unusual conditions			
8. INSTRUMENTATION			
8.1 Piezometers	No		
8.2 Settlement cells	No		
8.3 Thermistors	No		
8.4 Settlement monuments	No		
8.5 Seismograph	No		
8.6 Inclinometer	No		
8.7 Weirs and flow monitors	No		
8.8 Data logger(s)	No		
8.9 Other	No		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
9. DOCUMENTATION			
9.1 Operation, Maintenance and Surveillance (OMS) Plan			
9.1.1 OMS Plan exists	Yes		
9.1.2 OMS Plan reflects current dam conditions	Yes		
9.1.3 Date of last revision	March 2019		
9.2 Emergency Preparedness Plan (EPP)			
9.2.1 EPP exists	Yes		
9.2.2 EPP reflects current conditions	Yes		
9.2.3 Date of last revision	January 2018		
10. NOTES			
Inspector's Signature	Marion Habersetzer	**Date:**	July 21, 2020



Photograph A6-1 North-East Dike

Date: July 21, 2020 **Photo Number**: 322

Description: From approx. Sta. 0+200 on the West Leg (east abutment), looking west at the crest and downstream slope.



Photograph A6-2 North-East Dike

Date: July 21, 2020 **Photo Number**: 323

Description: From approx. Sta. 0+200 on the West Leg (east abutment), looking west at the crest.



Photograph A6-3 North-East Dike

Date: July 21, 2020 **Photo Number**: 324

Description: From approx. Sta. 0+200 on the West Leg (east abutment), looking west at the upstream liner tie-in. Presence of piping for dewatering.



Photograph A6-4 North-East Dike

Date: July 21, 2020 **Photo Number**: 325

Description: From approx. Sta. 0+150 on the West Leg, looking west at the upstream liner tie-in. Signs of settlement in the surface which occurred in 2019. Presence of piping for dewatering.



Photograph A6-5 North-East Dike

Date: July 21, 2020 **Photo Number**: 329

Description: From approx. Sta. 0+110 on the West Leg, looking east at the crest. Old cracks are disappearing.



Photograph A6-6 North-East Dike

Date: July 21, 2020 **Photo Number**: 328

Description: From approx. Sta. 0+030 on the West Leg (west abutment), looking east at the crest and downstream slope. Presence of water ponding at the downstream toe.



Photograph A6-7 North-East Dike

Date: July 21, 2020 **Photo Number**: 327

Description: From approx. Sta. 0+030 on the West Leg (west abutment), looking east at the crest.



Photograph A6-8 North-East Dike

Date: July 21, 2020 **Photo Number**: 326

Description: From approx. Sta. 0+030 on the West Leg (west abutment), looking east at the upstream liner tie-in. Presence of piping for dewatering.



Photograph A6-9 North-East Dike

Date: July 21, 2020 **Photo Number**: 330

Description: From approx. Sta. 0+300 on the East Leg (west abutment), looking east at the crest and downstream slope. Presence of water ponding at the downstream toe.



Photograph A6-10 North-East Dike

Date: July 21, 2020 **Photo Number**: 331

Description: From approx. Sta. 0+300 on the East Leg (west abutment), looking east at the crest. Presence of boulders and overburden material pushed on the crest during snow removal operations of the nearby road.



Photograph A6-11 North-East Dike

Date: July 21, 2020 **Photo Number**: 332

Description: From approx. Sta. 0+300 on the East Leg (west abutment), looking east at the upstream liner tie-in. Presence of piping for dewatering.



Photograph A6-12 North-East Dike

Date: July 21, 2020 **Photo Number**: 333

Description: From approx. Sta. 0+360 on the East Leg (west abutment), looking west at the upstream liner tie-in. Signs of settlement which occurred in 2019.



Photograph A6-13 North-East Dike

Date: July 21, 2020 **Photo Number**: 338

Description: From approx. Sta. 0+380 on the East Leg (west abutment), looking west at the downstream slope. Presence of water ponding at the toe.



Photograph A6-14 North-East Dike

Date: July 21, 2020 **Photo Number**: 337

Description: From approx. Sta. 0+430 on the East Leg (east abutment), looking west at the crest and downstream slope.



Photograph A6-15 North-East Dike

Date: July 21, 2020 **Photo Number**: 336

Description: From approx. Sta. 0+430 on the East Leg (east abutment), looking west at the crest.



Photograph A6-16 North-East Dike

Date: July 21, 2020 **Photo Number**: 334

Description: From approx. Sta. 0+430 on the East Leg (west abutment), looking east at the upstream liner tie-in. Presence of piping for dewatering.

APPENDIX A7

WRSF Dike

Client:	AEM	**By:**	Marion Habersetzer
Project:	Whale Tail Project	**Date:**	July 21, 2020
Location:	WRSF Dike	**Reviewed:**	Yves Boulianne

GENERAL INFORMATION			
Dam Type:	Rockfill shell with a bituminous geomembrane liner tied in a fine filter amended with bentonite and a protective cover. Upstream thermal berm composed of esker partially amended with bentonite and a rockfill protection cover.		
Weather Conditions:	Sunny	**Temperature:**	20°C

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1. DAM CREST		339, 340, 341, 342, 343, 344, 346, 347	
1.1 Crest elevation	El. 158.4 m (rockfill) El. 157.8 m (liner)		
1.2 Reservoir level	U/S El.153.0 m (WRSF pond)		
Current freeboard	5.4 m (rockfill crest) 4.8 m (liner)		Operational water level: 154 m
1.3 Distance to tailings pond (if applicable)	Not applicable		
1.4 Surface cracking	Yes	343	Old cracks are no longer visible. Minor cracks and potholes on the thermal berm crest surface.
1.5 Unexpected settlement	Yes		Settlement occurred in 2019.
1.6 Lateral movement	Not apparent		
1.7 Other unusual conditions	None		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
2. UPSTREAM SLOPE		341, 342, 343, 344, 345, 346	
2.1 Slope angle	2H: 1V		Adequate
2.2 Signs of erosion	None observed		
2.3 Signs of movement (deformation)	None observed		
2.4 Cracks	None observed		
2.5 Face liner condition (if applicable)	Not observed		Liner covered by thermal berm.
2.6 Other unusual conditions	None		
3. DOWNSTREAM SLOPE		339, 348, 350	
3.1 Slope angle	1.5H:1V		Adequate
3.2 Signs of erosion	None observed		
3.3 Signs of movement (deformation)	None observed		
3.4 Cracks	None observed		
3.5 Seepage or wet areas	None observed.		
3.6 Vegetation growth	No		
3.7 Other unusual conditions	None		
4. DOWNSTREAM TOE AREA		339, 348, 349, 350	
4.1 Seepage from dam	None observed		Water ponding at the toe. No flow observed.
4.2 Signs of erosion	None observed		
4.3 Signs of turbidity in seepage water	None		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
4.4 Discoloration/staining	No		
4.5 Outlet operating problem (if applicable)	Not applicable		
4.6 Other unusual conditions	None		
5. ABUTMENTS			
5.1 Seepage at contact zone (abutment/embankment)	None observed		
5.2 Signs of erosion	None observed		
5.3 Excessive vegetation	No		
5.4 Presence of rodent burrows	None observed		
5.5 Other unusual conditions	None		
6. RESERVOIR			
6.1 Stability of slopes	Stable		
6.2 Distance to nearest slide (if applicable)	Not applicable		
6.3 Estimate of slide volume (if applicable)	None observed		
6.4 Floating debris	None		
6.5 Other unusual conditions	None		
7. EMERGENCY SPILLWAY/ OUTLET STRUCTURE	No spillway or outlet structure exists		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
7.1 Surface condition			
7.2 Signs of erosion			
7.3 Signs of movement (deformation)			
7.4 Cracks			
7.5 Settlement			
7.6 Presence of debris or blockage			
7.7 Closure mechanism operational			
7.8 Slope protection			
7.9 Instability of side slopes			
7.10 Other unusual conditions			
8. INSTRUMENTATION			
8.1 Piezometers	No		
8.2 Settlement cells	No		
8.3 Thermistors	Yes		9 thermistors. See Section 4.2.2 of the report.
8.4 Settlement monuments	No		
8.5 Seismograph	No		
8.6 Inclinometer	No		
8.7 Weirs and flow monitors	No		
8.8 Data logger(s)	Yes		
8.9 Other	No		
9. DOCUMENTATION			

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
9.1 Operation, Maintenance and Surveillance (OMS) Plan			
9.1.1 OMS Plan exists	Yes		
9.1.2 OMS Plan reflects current dam conditions	Yes		
9.1.3 Date of last revision	March 2019		
9.2 Emergency Preparedness Plan (EPP)			
9.2.1 EPP exists	Yes		
9.2.2 EPP reflects current conditions	Yes		
9.2.3 Date of last revision	January 2018		
10. NOTES			
Inspector's Signature	Marion Habersetzer	**Date:**	July 21, 2020



Photograph A7-1 WRSF Dike

Date: July 21, 2020 **Photo Number**: 339

Description: From approx. Sta. 0+350 (east abutment), looking west at the dike crest and downstream slope. Presence of water ponding at the toe.



Photograph A7-2 WRSF Dike

Date: July 21, 2020 **Photo Number**: 340

Description: From approx. Sta. 0+350 (east abutment), looking west at the dike crest.



Photograph A7-3 WRSF Dike

Date: July 21, 2020 **Photo Number**: 341

Description: From approx. Sta. 0+350 (east abutment), looking west at the upstream thermal berm crest.



Photograph A7-4 WRSF Dike

Date: July 21, 2020 **Photo Number**: 342

Description: From approx. Sta. 0+350 (east abutment), looking west at the upstream thermal berm slope and dewatering ramp.



Photograph A7-5 WRSF Dike

Date: July 21, 2020 **Photo Number**: 343

Description: From approx. Sta. 0+210, looking east at the upstream thermal berm and dewatering ramp. Presence of minor potholes in the surface.



Photograph A7-6 WRSF Dike

Date: July 21, 2020 **Photo Number**: 344

Description: From approx. Sta. 0+210, looking west at the upstream thermal berm.



Photograph A7-7 WRSF Dike

Date: July 21, 2020 **Photo Number**: 345

Description: From approx. Sta. 0+080 (west abutment), looking east at the upstream thermal berm slope and the upstream toe.



Photograph A7-8 WRSF Dike

Date: July 21, 2020 **Photo Number**: 346

Description: From approx. Sta. 0+080 (west abutment), looking east at the upstream thermal berm crest.



Photograph A7-9 WRSF Dike

Date: July 21, 2020 **Photo Number**: 347

Description: From approx. Sta. 0+080 (west abutment), looking east at the dike crest.



Photograph A7-10 WRSF Dike

Date: July 21, 2020 **Photo Number**: 348

Description: From approx. Sta. 0+080 (west abutment), looking east at the downstream toe.



Photograph A7-11 WRSF Dike

Date: July 21, 2020 **Photo Number**: 349

Description: From approx. Sta. 0+100, looking south at the downstream toe and Mammoth Lake.



Photograph A7-12 WRSF Dike

Date: July 21, 2020 **Photo Number**: 350

Description: From approx. Sta. 0+100, looking southeast at the downstream toe and the downstream collection sump.

APPENDIX A8

Mammoth Dike

Client:	AEM	**By:**	Marion Habersetzer
Project:	Whale Tail Project	**Date:**	July 20, 2020
Location:	Mammoth Dike	**Reviewed:**	Yves Boulianne

GENERAL INFORMATION			
Dam Type:	Rockfill shell with a bituminous geomembrane liner tied in a fine filter amended with bentonite and a protective cover.		
Weather Conditions:	Sunny	**Temperature:**	20°C

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1. DAM CREST		263, 264, 265, 271, 272, 273, 274	
1.1 Crest elevation	El. 155 m (rockfill) El. 153.5 m (liner)		
1.2 Reservoir level	U/S El.152.69 m (Mammoth Lake)		
Current freeboard	2.31 m (rockfill crest) 0.81 m (liner)		Operational water level: 152.5 m
1.3 Distance to tailings pond (if applicable)	Not applicable		
1.4 Surface cracking	Not apparent		
1.5 Unexpected settlement	Not apparent		
1.6 Lateral movement	Not apparent		
1.7 Other unusual conditions	None		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
2. UPSTREAM SLOPE		267, 268, 269, 270, 271	
2.1 Slope angle	2H: 1V		Adequate
2.2 Signs of erosion	None observed		
2.3 Signs of movement (deformation)	None observed		
2.4 Cracks	None observed		
2.5 Face liner condition (if applicable)	Not observed		Liner covered by thermal berm.
2.6 Other unusual conditions	None		
3. DOWNSTREAM SLOPE		263, 264, 265, 266, 272	
3.1 Slope angle	1.5H:1V		Adequate
3.2 Signs of erosion	None observed		
3.3 Signs of movement (deformation)	None observed		
3.4 Cracks	None observed		
3.5 Seepage or wet areas	None observed.		
3.6 Vegetation growth	No		
3.7 Other unusual conditions	None		
4. DOWNSTREAM TOE AREA		263, 264, 265, 266, 272	
4.1 Seepage from dam	None observed		Water ponding some distance from the toe. No flow observed. The pond was being pumped out at the time of the inspection.
4.2 Signs of erosion	None observed		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
4.3 Signs of turbidity in seepage water	None		
4.4 Discoloration/staining	No		
4.5 Outlet operating problem (if applicable)	Not applicable		
4.6 Other unusual conditions	None		
5. ABUTMENTS			
5.1 Seepage at contact zone (abutment/embankment)	None observed		
5.2 Signs of erosion	None observed		
5.3 Excessive vegetation	No		
5.4 Presence of rodent burrows	None observed		
5.5 Other unusual conditions	None		
6. RESERVOIR			
6.1 Stability of slopes	Stable		
6.2 Distance to nearest slide (if applicable)	Not applicable		
6.3 Estimate of slide volume (if applicable)	None observed		
6.4 Floating debris	None		
6.5 Other unusual conditions	None		
7. EMERGENCY SPILLWAY/ OUTLET STRUCTURE	No spillway or outlet structure exists		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
7.1 Surface condition			
7.2 Signs of erosion			
7.3 Signs of movement (deformation)			
7.4 Cracks			
7.5 Settlement			
7.6 Presence of debris or blockage			
7.7 Closure mechanism operational			
7.8 Slope protection			
7.9 Instability of side slopes			
7.10 Other unusual conditions			
8. INSTRUMENTATION			
8.1 Piezometers	No		
8.2 Settlement cells	No		
8.3 Thermistors	Yes		3 thermistors. See Section 4.4.2 of the report.
8.4 Settlement monuments	No		
8.5 Seismograph	No		
8.6 Inclinometer	No		
8.7 Weirs and flow monitors	No		
8.8 Data logger(s)	Yes		
8.9 Other	No		
9. DOCUMENTATION			

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
9.1 Operation, Maintenance and Surveillance (OMS) Plan			
9.1.1 OMS Plan exists	Yes		
9.1.2 OMS Plan reflects current dam conditions	Yes		
9.1.3 Date of last revision	March 2019		
9.2 Emergency Preparedness Plan (EPP)			
9.2.1 EPP exists	Yes		
9.2.2 EPP reflects current conditions	Yes		
9.2.3 Date of last revision	January 2018		
10. NOTES			
Inspector's Signature	Marion Habersetzer	**Date:**	July 20, 2020



Photograph A8-1 Mammoth Dike

Date: July 20, 2020 **Photo Number**: 271

Description: From approx. Sta. 0+300 (south abutment), looking north to the crest and upstream liner tie-in.



Photograph A8-2 Mammoth Dike

Date: July 20, 2020 **Photo Number**: 272

Description: From approx. Sta. 0+300 (south abutment), looking north to the crest and downstream slope.



Photograph A8-3 Mammoth Dike

Date: July 20, 2020 **Photo Number**: 263

Description: From approx. Sta. 0+200, looking south to the crest and downstream slope.



Photograph A8-4 Mammoth Dike

Date: July 20, 2020 **Photo Number**: 264

Description: From approx. Sta. 0+200, looking north to the crest and downstream slope. Presence of water ponding some distance away from the toe, in the process of being pumped out.



Photograph A8-5 Mammoth Dike

Date: July 20, 2020 **Photo Number**: 265

Description: From approx. Sta. 0+100 (north abutment), looking south to the crest and downstream slope.



Photograph A8-6 Mammoth Dike

Date: July 20, 2020 **Photo Number**: 266

Description: From approx. Sta. 0+100 (north abutment), looking south downstream slope and downstream area. Presence of water ponding some distance away from the toe, in the process of being pumped out.



Photograph A8-7 Mammoth Dike

Date: July 20, 2020 **Photo Number**: 267

Description: From approx. Sta. 0+110 (north abutment), looking south to the upstream liner tie-in.



Photograph A8-8 Mammoth Dike

Date: July 20, 2020 **Photo Number**: 269

Description: From approx. Sta. 0+180, looking north to the upstream liner tie-in.



Photograph A8-9 Mammoth Dike

Date: July 20, 2020 **Photo Number**: 268

Description: From approx. Sta. 0+180, looking south to the upstream liner tie-in.



Photograph A8-10 Mammoth Dike

Date: July 20, 2020 **Photo Number**: 270

Description: From approx. Sta. 0+250, looking north to the upstream liner tie-in.



Photograph A8-11 Mammoth Dike

Date: July 20, 2020 **Photo Number**: 274

Description: From approx. Sta. 0+180, looking north to the crest.



Photograph A8-12 Mammoth Dike

Date: July 20, 2020 **Photo Number**: 273

Description: From approx. Sta. 0+180, looking south to the crest.

APPENDIX B

Tailings Storage Facility

APPENDIX B1

North Cell Internal Structure

Client:	AEM	**By:**	Marion Habersetzer
Project:	Meadowbank	**Date:**	July 14, 2020
Location:	North Cell Internal Structure	**Reviewed:**	Yves Boulianne

GENERAL INFORMATION			
Dam Type:	Rockfill embankment with upstream filters built inside the existing North Cell		
Weather Conditions:	Rainy	**Temperature:**	10°C

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1. DAM CREST		135, 142, 143, 144, 145	
1.1 Crest elevation	152 to 154 m		Design 154 m
1.2 Reservoir level	149.5 m to 152.1 m – tailings 146.46 m - water		
Current freeboard	2.5 m to 4.5 m - tailings 3.04 m to 5.64 m - water		Design 2 m water, 0.5 m tailings
1.3 Distance to tailings pond (if applicable)	>100 m		Tailings beach all along the NCIS
1.4 Surface cracking	Yes		Small tension cracks (a few millimeters wide) in the fine filter surface, parallel to crest (2+780).
1.5 Unexpected settlement	None observed		
1.6 Lateral movement	Not apparent		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1.7 Other unusual conditions	None		Some water ponding on crest due to snow melt and precipitations.
2. UPSTREAM SLOPE		132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145	
2.1 Slope angle	Approx. 3H:1V		Rockfill
2.2 Signs of erosion	Erosion of the toe of the fine filter slope. Localized erosion features on upstream slope.	135, 136, 137, 138, 139	Due to channelling of water at the toe of the slope (2+460 to 2+940) and water draining from the crest at freshet.
2.3 Signs of movement (deformation)	Yes	133, 135	Limited sloughing of the fine filter layer at 3+100 (2 m wide circular area). On going erosion of the scar in fine filter. Settlement of toe of slope in the East area of the structure leading to deformation of the slope.
2.4 Cracks	Tension cracks between Sta. 2+300 and 3+150 m.	132, 134, 140, 141	Tension cracks (2 to 5 m long, 1 to 15 cm wide) in the fine filter surface, parallel to crest, in the slope.
2.5 Face liner condition (if applicable)	In good condition		
2.6 Other unusual conditions	None		
3. DOWNSTREAM SLOPE			
3.1 Slope angle	Approx.1.2H or 1.3 H:1V variable		Rockfill
3.2 Signs of erosion	None observed		
3.3 Signs of movement (deformation)	None observed		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
3.4 Cracks	None observed		
3.5 Seepage or wet areas	None observed		
3.6 Vegetation growth	None observed		
3.7 Other unusual conditions	None		
4. DOWNSTREAM TOE AREA			
4.1 Seepage from dam	Yes		Pumping stations are in place downstream of the structure and in operation as needed.
4.2 Signs of erosion	None observed		
4.3 Signs of turbidity in seepage water	Not applicable		
4.4 Discoloration/staining	No		
4.5 Outlet operating problem (if applicable)	Not applicable		
4.6 Other unusual conditions			
5. ABUTMENTS			
5.1 Seepage at contact zone (abutment/embankment)	None observed		
5.2 Signs of erosion	None observed		
5.3 Excessive vegetation	No		
5.4 Presence of rodent burrows	None observed		
5.5 Other unusual conditions	None		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
6. RESERVOIR			
6.1 Stability of slopes	Stable		
6.2 Distance to nearest slide	None observed		
6.3 Estimate of slide volume (if applicable)	Not applicable		
6.4 Floating debris	None observed		
6.5 Other unusual conditions	No		
7. EMERGENCY SPILLWAY/ OUTLET STRUCTURE			
7.1 Surface condition	No spillway or outlet structure exists, only dewatering pump.		
7.2 Signs of erosion			
7.3 Signs of movement (deformation)			
7.4 Cracks			
7.5 Settlement			
7.6 Presence of debris or blockage			
7.7 Closure mechanism operational			
7.8 Slope protection			
7.9 Instability of side slopes			
7.10 Other unusual conditions			
8. INSTRUMENTATION			

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
8.1 Piezometers	No		
8.2 Settlement cells	No		
8.3 Thermistors	Yes		See Section 5.4.2 of the report.
8.4 Settlement monuments	Yes		16 prisms installed. See Section 5.4.2 of the report.
8.5 Seismograph	No		
8.6 Inclinometer	No		
8.7 Weirs and flow monitors	No		A temporary seepage collection and pump back system is built and will be completed at a later time according to the design.
8.8 Data logger(s)	Yes		
8.9 Other			
9. DOCUMENTATION			
9.1 Operation, Maintenance and Surveillance (OMS) Plan			
9.1.1 OMS Plan exists	Yes		
9.1.2 OMS Plan reflects current dam conditions	Yes		
9.1.3 Date of last revision	March 2019		
9.2 Emergency Preparedness Plan (EPP)			
9.2.1 EPP exists	Yes		
9.2.2 EPP reflects current conditions	Yes		
9.2.3 Date of last revision	June 2020		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
10. NOTES : Remediation plan is in preparation by the AEM team to repair the eroded fine filter layer.			
Inspector's Signature	Marion Habersetzer	**Date:**	July 14, 2020



Photograph B1-1 Tailings Storage Facility

Date: July 14, 2020 **Photo Number**: 144

Description: From the North Cell Internal Structure, looking northeast toward the upstream slope and the North Cell.



Photograph B1-2 Tailings Storage Facility

Date: July 14, 2020 **Photo Number**: 145

Description: From the North Cell Internal Structure, looking southwest toward the upstream slope and the North Cell.



Photograph B1-3 Tailings Storage Facility

Date: July 14, 2020 **Photo Number**: 142

Description: From the North Cell Internal Structure, looking southwest at the North Cell.



Photograph B1-4 Tailings Storage Facility

Date: July 14, 2020 **Photo Number**: 143

Description: From the North Cell Internal Structure, looking southeast at the North Cell.



Photograph B1-5 Tailings Storage Facility

Date: July 14, 2020 **Photo Number**: 141

Description: From the North Cell Internal Structure at approx. Sta. 2+300, looking north at the upstream slope. Presence of tension cracks (150 mm wide) in the fine filter.



Photograph B1-6 Tailings Storage Facility

Date: July 14, 2020 **Photo Number**: 140

Description: From the North Cell Internal Structure at approx. Sta. 2+400, looking northwest at the upstream slope. Presence of tension cracks in the fine filter.



Photograph B1-7 Tailings Storage Facility

Date: July 14, 2020 **Photo Number**: 138

Description: From the North Cell Internal Structure at approx. Sta. 2+400, looking northwest at the upstream slope. Presence of erosion features in the fine filter and water at the toe. A pipe is discharging water at the toe of the slope.



Photograph B1-8 Tailings Storage Facility

Date: July 14, 2020 **Photo Number**: 139

Description: From the North Cell Internal Structure at approx. Sta. 2+400, looking west at the upstream slope from the crest. Presence of erosion features in the fine filter and water at the toe.



Photograph B1-9 Tailings Storage Facility

Date: July 14, 2020 **Photo Number**: 136

Description: From the North Cell Internal Structure at approx. Sta. 2+700, looking northwest at the upstream slope. Presence of water at the toe. A pipe is discharging water at the toe of the slope.



Photograph B1-10 Tailings Storage Facility

Date: July 14, 2020 **Photo Number**: 135

Description: From the North Cell Internal Structure at approx. Sta. 2+700, looking northwest at the upstream slope. Presence of water at the toe.



Photograph B1-11 Tailings Storage Facility

Date: July 14, 2020 **Photo Number**: 134

Description: From the North Cell Internal Structure at approx. Sta. 2+750, looking at the crest. Presence of narrow tension cracks on the crest.



Photograph B1-12 Tailings Storage Facility

Date: July 14, 2020 **Photo Number**: 132

Description: From the North Cell Internal Structure at approx. Sta. 3+100, looking southwest at the upstream slope. Presence tension cracks.



Photograph B1-13 Tailings Storage Facility

Date: July 14, 2020 **Photo Number**: 133

Description: From the North Cell Internal Structure at approx. Sta. 3+100, looking at the upstream slope from the toe. Presence of a sloughing area where the fine filter has been eroded.

APPENDIX B2

Saddle Dam 1

Client:	AEM	**By:**	Marion Habersetzer
Project:	Meadowbank	**Date:**	July 14, 2020
Location:	Saddle Dam 1	**Reviewed:**	Yves Boulianne

GENERAL INFORMATION			
Dam Type:	Rockfill embankment with inverted filter on base, upstream filters, a geomembrane liner tied in a toe till plug and protective cover.		
Weather Conditions:	Sunny	**Temperature:**	15°C

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1. DAM CREST		101, 102, 103, 105, 107, 108	
1.1 Crest elevation	150 m		Design 150 m
1.2 Reservoir level	149.5 m - tailings		
Current freeboard	0.5 m -tailings		Design 2 m water, 0.5 m tailings
1.3 Distance to tailings pond (if applicable)	>300 m		Tailings beach all along SD1
1.4 Surface cracking	None at time of inspection		
1.5 Unexpected settlement	None observed		
1.6 Lateral movement	Not apparent		
1.7 Other unusual conditions	None		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
2. UPSTREAM SLOPE		101, 102, 103, 104, 105	
2.1 Slope angle	Approx. 3H:1V		Rockfill
2.2 Signs of erosion	None observed		
2.3 Signs of movement (deformation)	None observed		
2.4 Cracks	None observed		
2.5 Face liner condition (if applicable)	In good condition		
2.6 Other unusual conditions	None		
3. DOWNSTREAM SLOPE		99, 106	
3.1 Slope angle	Approx.1.2H or 1.3 H:1V variable		Rockfill
3.2 Signs of erosion	None observed		
3.3 Signs of movement (deformation)	None observed		
3.4 Cracks	None observed		
3.5 Seepage or wet areas	None observed		
3.6 Vegetation growth	None observed		
3.7 Other unusual conditions	None		
4. DOWNSTREAM TOE AREA		99, 106	
4.1 Seepage from dam	Uncertain		A dewatering sump is installed downstream. Water was observed ponding in that area.
4.2 Signs of erosion	None observed		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
4.3 Signs of turbidity in seepage water	Not applicable		
4.4 Discoloration/staining	No		
4.5 Outlet operating problem (if applicable)	Not applicable		
4.6 Other unusual conditions			
5. ABUTMENTS			
5.1 Seepage at contact zone (abutment/embankment)	None observed		
5.2 Signs of erosion	None observed		
5.3 Excessive vegetation	No		
5.4 Presence of rodent burrows	None observed		
5.5 Other unusual conditions	None		
6. RESERVOIR		100, 104	
6.1 Stability of slopes	Stable		
6.2 Distance to nearest slide	None observed		
6.3 Estimate of slide volume (if applicable)	Not applicable		
6.4 Floating debris	None observed		
6.5 Other unusual conditions	No		A small pond of water was observed in the tailings and is not a concern.
7. EMERGENCY SPILLWAY/ OUTLET STRUCTURE			

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
7.1 Surface condition	No spillway or outlet structure exists, only dewatering pump.		
7.2 Signs of erosion			
7.3 Signs of movement (deformation)			
7.4 Cracks			
7.5 Settlement			
7.6 Presence of debris or blockage			
7.7 Closure mechanism operational			
7.8 Slope protection			
7.9 Instability of side slopes			
7.10 Other unusual conditions			
8. INSTRUMENTATION			
8.1 Piezometers	No		
8.2 Settlement cells	No		
8.3 Thermistors	Yes		See Section 5.2.2 of the report.
8.4 Settlement monuments	No		Construction drawings show settlement monuments to be installed on Stage 2 crest.
8.5 Seismograph	No		
8.6 Inclinometer	No		
8.7 Weirs and flow monitors	No		Per the design, a seepage collection and pump back system is built.
8.8 Data logger(s)	Yes		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
8.9 Other			
9. DOCUMENTATION			
9.1 Operation, Maintenance and Surveillance (OMS) Plan			
9.1.1 OMS Plan exists	Yes		
9.1.2 OMS Plan reflects current dam conditions	Yes		
9.1.3 Date of last revision	March 2019		
9.2 Emergency Preparedness Plan (EPP)			
9.2.1 EPP exists	Yes		
9.2.2 EPP reflects current conditions	Yes		
9.2.3 Date of last revision	June 2020		
10. NOTES :			

Inspector's Signature	Marion Habersetzer	**Date:**	July 14, 2020



Photograph B2-1 Saddle Dam 1

Date: July 14, 2020 **Photo Number**: 106

Description: From the south abutment (Sta. 0+350) looking north at the downstream face. Notice the sea-can container where a sump is installed.



Photograph B2-2 Saddle Dam 1

Date: July 14, 2020 **Photo Number**: 99

Description: From Sta. 0+150 looking southwest at the downstream face. Notice the sea-can container where a sump is installed.



Photograph B2-3 Saddle Dam 1

Date: July 14, 2020 **Photo Number**: 107

Description: From approximately Sta. 0+225, looking north at the crest.



Photograph B2-4 Saddle Dam 1

Date: July 14, 2020 **Photo Number**: 108

Description: From approximately Sta. 0+225, looking south at the crest.



Photograph B2-5 Saddle Dam 1

Date: July 14, 2020 **Photo Number**: 101

Description: From approximately Sta. 0+055, looking south at the crest and upstream slope.



Photograph B2-6 Saddle Dam 1

Date: July 14, 2020 **Photo Number**: 102

Description: From approximately Sta. 0+195 upstream, looking south at the upstream slope. Adequate tailings beach against SD1. A small pond of water is present at the surface of the tailings and is not a concern.



Photograph B2-7 Saddle Dam 1

Date: July 14, 2020 **Photo Number**: 103

Description: From approximately Sta. 0+195 upstream, looking north at the upstream slope. Adequate tailings beach against SD1.



Photograph B2-8 Saddle Dam 1

Date: July 14, 2020 **Photo Number**: 105

Description: From the south abutment looking north at the upstream slope. Adequate tailings beach against SD1.



Photograph B2-9 Saddle Dam 1

Date: July 14, 2020 **Photo Number**: 104

Description: From the south abutment looking east at the upstream slope and the North Cell.



Photograph B2-10 Saddle Dam 1

Date: July 14, 2020 **Photo Number**: 100

Description: From approximately Sta. 0+050 upstream, looking east at the North Cell.

APPENDIX B3

Saddle Dam 2

Client:	AEM	**By:**	Marion Habersetzer
Project:	Meadowbank	**Date:**	July 14, 2020
Location:	Saddle Dam 2	**Reviewed:**	Yves Boulianne

GENERAL INFORMATION			
Dam Type:	Rockfill embankment with inverted filter on base, upstream filters, a geomembrane liner tied in a toe till plug and upstream till blanket.		
Weather Conditions:	Sunny	**Temperature:**	15°C

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1. DAM CREST		109, 111, 112, 114, 115	
1.1 Crest elevation	150 m		Design 150 m
1.2 Reservoir level	149.5 m - tailings		
Current freeboard	0.5 m - tailings		Design 2 m water, 0.5 m tailings
1.3 Distance to tailings pond (if applicable)	>200 m		Adequate tailings beach
1.4 Surface cracking	None at time of inspection		
1.5 Unexpected settlement	None observed		
1.6 Lateral movement	Not apparent		
1.7 Other unusual conditions	None		
2. UPSTREAM SLOPE		111, 112, 113, 115	
2.1 Slope angle	Approx. 3H:1V		Rockfill
2.2 Signs of erosion	None observed		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
2.3 Signs of movement (deformation)	None observed		
2.4 Cracks	None observed		
2.5 Face liner condition (if applicable)	Good		Wooden pallet on liner at 20+475 to remove.
2.6 Other unusual conditions	None		
3. DOWNSTREAM SLOPE		114	
3.1 Slope angle	Approx.1.2H or 1.3H:1V variable		Rockfill
3.2 Signs of erosion	None observed		
3.3 Signs of movement (deformation)	None observed		
3.4 Cracks	None observed		
3.5 Seepage or wet areas	None observed on slope		
3.6 Vegetation growth	None observed		
3.7 Other unusual conditions	None		
4. DOWNSTREAM TOE AREA		114	
4.1 Seepage from dam	No		
4.2 Signs of erosion	None observed		
4.3 Signs of turbidity in seepage water	Not applicable		
4.4 Discoloration/staining	No		
4.5 Outlet operating problem (if applicable)	Not applicable		
4.6 Other unusual conditions	Yes		Limited water is still ponding within the rockfill embankment between 20+275 to 20+475 approximately.

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
5. ABUTMENTS			
5.1 Seepage at contact zone (abutment/embankment)	None observed		
5.2 Signs of erosion	None observed		
5.3 Excessive vegetation	No		
5.4 Presence of rodent burrows	None observed		
5.5 Other unusual conditions	None		
6. RESERVOIR		110	
6.1 Stability of slopes	Stable		
6.2 Distance to nearest slide (if applicable)	None observed		
6.3 Estimate of slide volume (if applicable)	Not applicable		
6.4 Floating debris	None observed		
6.5 Other unusual conditions	No		
7. EMERGENCY SPILLWAY/ OUTLET STRUCTURE			
7.1 Surface condition	No spillway or outlet structure exists, only dewatering pump.		
7.2 Signs of erosion			
7.3 Signs of movement (deformation)			
7.4 Cracks			
7.5 Settlement			
7.6 Presence of debris or blockage			

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
7.7 Closure mechanism operational			
7.8 Slope protection			
7.9 Instability of side slopes			
7.10 Other unusual conditions			
8. INSTRUMENTATION			
8.1 Piezometers	No		
8.2 Settlement cells	No		
8.3 Thermistors	Yes		See Section 5.3.2 of the report.
8.4 Settlement monuments	No		Construction drawings show displacement monitoring on Stage 2 crest.
8.5 Seismograph	No		
8.6 Inclinometer	No		
8.7 Weirs and flow monitors	No		
8.8 Data logger(s)	Yes		
8.9 Other			
9. DOCUMENTATION			
9.1 Operation, Maintenance and Surveillance (OMS) Plan			
9.1.1 OMS Plan exists	Yes		
9.1.2 OMS Plan reflects current dam conditions	Yes		
9.1.3 Date of last revision	March 2019		
9.2 Emergency Preparedness Plan (EPP)			
9.2.1 EPP exists	Yes		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
9.2.2 EPP reflects current conditions	Yes		
9.2.3 Date of last revision	June 2020		
10. NOTES :			
Inspector's Signature	Marion Habersetzer	**Date:**	July 14, 2020



Photograph B3-1 Saddle Dam 2

Date: July 14, 2020 **Photo Number**: 109
Description: From Saddle Dam 2 (approximately Sta. 20+110) looking southeast at the crest. Presence of piping.



Photograph B3-2 Saddle Dam 2

Date: July 14, 2020 **Photo Number**: 110

Description: From Saddle Dam 2 (approximately Sta. 20+110) upstream, looking southeast at the upstream slope and the North Cell. The tailings beach against SD2 is adequate.



Photograph B3-3 Saddle Dam 2

Date: July 14, 2020 **Photo Number**: 111

Description: From approximately Sta. 20+370 looking southeast at the crest and upstream slope.



Photograph B3-4 Saddle Dam 2

Date: July 14, 2020 **Photo Number**: 112

Description: From approximately Sta. 20+370 looking northwest at the crest and upstream slope.



Photograph B3-5 Saddle Dam 2

Date: July 14, 2020 **Photo Number**: 115
Description: From approximately Sta. 20+525, looking northwest at the crest and upstream slope.



Photograph B3-6 Saddle Dam 2

Date: July 14, 2020 **Photo Number**: 113
Description: From approximately Sta. 20+475, looking northeast at the upstream slope. Presence of a wooden pallet on the liner.



Photograph B3-7 Saddle Dam 2

Date: July 14, 2020 **Photo Number**: 114

Description: From Saddle Dam 2 (approximately Sta. 20+500) downstream, looking northwest at the downstream toe and slope of Saddle Dam 2. Some water is ponding at the toe.

APPENDIX B4

Stormwater Dike

Client:	AEM	**By:**	Marion Habersetzer
Project:	Meadowbank	**Date:**	July 14, 2020
Location:	Stormwater Dike	**Reviewed:**	Yves Boulianne

GENERAL INFORMATION			
Dam Type:	Rockfill embankment, upstream filters and a bituminous geomembrane liner. Compacted till placed above liner at toe, prior to tailings deposition.		
Weather Conditions:	Rainy	**Temperature:**	10°C

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1. DAM CREST		124, 125, 126, 127, 128, 129, 130	
1.1 Crest elevation	150 m		Design 150 m
1.2 Reservoir level	146.46 – water 144.6 m (max) – tailings (South Cell) 149.5 m - tailings (North Cell)		
Current freeboard	3.54 m – water 5.4 m - tailings (South Cell) 0.5 m – tailings (North Cell)		Design 2 m in operation and 1 m at closure for water and 0.5 m for tailings.

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1.3 Distance to tailings pond (if applicable)	Adequate (North Cell)		Adequate beach in place all along the dike on North Cell. Some shallow water ponding against dike in some places (from 10+550 to 10+950 approximately). Water and tailings have reached the toe of the structure in the South Cell.
1.4 Surface cracking	No		Old tension cracks (mostly around 10+300) are inactive and are disappearing. They have since been filled with bentonite.
1.5 Unexpected settlement	No		
1.6 Lateral movement	No		
1.7 Other unusual conditions			
2. UPSTREAM SLOPE		125, 126, 127, 130	
2.1 Slope angle	Approx. 3H:1V		Rockfill
2.2 Signs of erosion	None observed		
2.3 Signs of movement (deformation)	None observed		
2.4 Cracks	None observed		
2.5 Face liner condition (if applicable)	Good conditions.		
2.6 Other unusual conditions	None		
3. DOWNSTREAM SLOPE		124, 131	
3.1 Slope angle	Approx.1.2H or 1.5 H:1V variable		Rockfill
3.2 Signs of erosion	None observed		
3.3 Signs of movement (deformation)	None observed		
3.4 Cracks	None observed		
3.5 Seepage or wet areas	None observed on slope		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
3.6 Vegetation growth	None observed		
3.7 Other unusual conditions	None		
4. DOWNSTREAM TOE AREA	Not visible		Downstream toe and berm is submerged by the South Cell pond. The berm was constructed at the downstream toe to stabilize the movement and cracks observed in 2016.
4.1 Seepage from dam	Not visible		
4.2 Signs of erosion	Not visible		
4.3 Signs of turbidity in seepage water	Not visible		
4.4 Discoloration/staining	Not visible		
4.5 Outlet operating problem (if applicable)	Not applicable		
4.6 Other unusual conditions	Not visible		
5. ABUTMENTS			
5.1 Seepage at contact zone (abutment/embankment)	None observed		
5.2 Signs of erosion	None observed		
5.3 Excessive vegetation	No		
5.4 Presence of rodent burrows	None observed		
5.5 Other unusual conditions	None		
6. RESERVOIR			
6.1 Stability of slopes	Stable		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
6.2 Distance to nearest slide (if applicable)	None observed		
6.3 Estimate of slide volume (if applicable)	Not applicable		
6.4 Floating debris	None observed		
6.5 Other unusual conditions	No		
7. EMERGENCY SPILLWAY/ OUTLET STRUCTURE	No spillway or outlet structure exists, only dewatering pump		
7.1 Surface condition			
7.2 Signs of erosion			
7.3 Signs of movement (deformation)			
7.4 Cracks			
7.5 Settlement			
7.6 Presence of debris or blockage			
7.7 Closure mechanism operational			
7.8 Slope protection			
7.9 Instability of side slopes			
7.10 Other unusual conditions			
8. INSTRUMENTATION			
8.1 Piezometers	Yes		See Section 5.5.2
8.2 Settlement cells	No		
8.3 Thermistors	Yes		See Section 5.5.2
8.4 Settlement monuments	Yes		See Section 5.5.2
8.5 Seismograph	No		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
8.6 Inclinometer	No		
8.7 Weirs and flow monitors	No		
8.8 Data logger(s)	No		
8.9 Other	None		
9. DOCUMENTATION			
9.1 Operation, Maintenance and Surveillance (OMS) Plan			
9.1.1 OMS Plan exists	Yes		
9.1.2 OMS Plan reflects current dam conditions	Yes		
9.1.3 Date of last revision	March 2019		
9.2 Emergency Preparedness Plan (EPP)			
9.2.1 EPP exists	Yes		
9.2.2 EPP reflects current conditions	Yes		
9.2.3 Date of last revision	June 2020		
10. NOTES :			
Inspector's Signature	Marion Habersetzer	**Date:**	July 14, 2020



Photograph B4-1 Stormwater Dike

Date: July 14, 2020 **Photo Number**: 125

Description: From the east abutment (11+100 approximately), looking west at the upstream face and the rockfill cover of the North Cell. Shallow water ponding against portion of the dike (less than 30 cm deep). Large rocks are present near the liner.



Photograph B4-2 Stormwater Dike

Date: July 14, 2020 **Photo Number**: 124

Description: From the east abutment (11+100 approximately), looking west at the downstream slope.



Photograph B4-3 Stormwater Dike

Date: July 14, 2020 **Photo Number**: 126

Description: From Sta. 10+650 looking east at the crest and upstream slope.



Photograph B4-4 Stormwater Dike

Date: July 14, 2020 **Photo Number**: 127

Description: From Sta. 10+650 looking west at the crest and upstream slope. Shallow water against portion of Stormwater Dike.



Photograph B4-5 Stormwater Dike

Date: July 14, 2020 **Photo Number**: 129

Description: From approximately Sta. 10+650 looking west at the crest.



Photograph B4-6 Stormwater Dike

Date: July 14, 2020 **Photo Number**: 128

Description: From approximately Sta. 10+650 looking east at the crest.



Photograph B4-7 Stormwater Dike

Date: July 14, 2020 **Photo Number**: 130

Description: From Sta.10+175, looking east at the upstream slope. The tailings beach is adequate.



Photograph B4-8 Stormwater Dike

Date: July 14, 2020 **Photo Number**: 131

Description: From Sta.10+250, looking east at the downstream slope and the South Cell. The downstream toe is covered with water in this section.

APPENDIX B5

Saddle Dam 3

Client:	AEM	**By:**	Marion Habersetzer
Project:	Meadowbank	**Date:**	July 14, 2020
Location:	Saddle Dam 3	**Reviewed:**	Yves Boulianne

GENERAL INFORMATION			
Dam Type:	Rockfill embankment with inverted filter on base, upstream filters, a geomembrane liner tied in a toe till plug and upstream till blanket.		
Weather Conditions:	Overcast	**Temperature:**	10°C

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1. DAM CREST		118, 119, 120	
1.1 Crest elevation	145 m		Designed to be able to be raised up to El. 150 m
1.2 Reservoir Level	141.09 m - water 132 m – tailings (West extremity of the South Cell)		
Current Freeboard	3.9 (water)		Water is in contact with the structure (against erosion protection cover).
1.3 Distance To Tailings Pond (if applicable)	NA		Water now reaches the structure but no tailings are planned to be in contact with the structure.
1.4 Surface Cracking	None at time of inspection		
1.5 Unexpected Settlement	None observed		
1.6 Lateral Movement	Not apparent		
1.7 Other Unusual Conditions	None		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
2. UPSTREAM SLOPE		117	
2.1 Slope angle	3H:1V		
2.2 Signs of Erosion	None observed		
2.3 Signs of Movement (Deformation)	None observed		
2.4 Cracks	None observed		
2.5 Face liner condition (if applicable)	Good		
2.6 Other Unusual Conditions	None		
3. DOWNSTREAM SLOPE		120	
3.1 Slope angle	1.5H:1V		
3.2 Signs of Erosion	None observed		
3.3 Signs of Movement (Deformation)	None observed		
3.4 Cracks	None observed		
3.5 Seepage or Wet Areas	None observed on slope		
3.6 Vegetation Growth	None observed		
3.7 Other Unusual Conditions	None		
4. DOWNSTREAM TOE AREA		120	
4.1 Seepage from Dam	No		
4.2 Signs of Erosion	None observed		
4.3 Signs of Turbidity in Seepage Water	Not applicable		
4.4 Discoloration/staining	No		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
4.5 Outlet operating problem (if applicable)	Not applicable		
4.6 Other Conditions	Yes		A sump was constructed on the downstream side to collect the ponding water, so its level does not exceed the elevation of the granular layer of the upstream toe liner tie-in.
5. ABUTMENTS			
5.1 Seepage at contact zone (abutment/embankment)	None observed		
5.2 Signs of Erosion	None observed		
5.3 Excessive Vegetation	No		
5.4 Presence of Rodent Burrows	None observed		
5.5 Other Unusual Conditions	None		
6. RESERVOIR			
6.1 Stability of Slopes	Stable		
6.2 Distance to Nearest Slide (if applicable)	None observed		
6.3 Estimate of Slide Volume (if applicable)	Not applicable		
6.4 Floating debris	None observed		
6.5 Other Unusual Conditions	No		
7. EMERGENCY SPILLWAY/ OUTLET STRUCTURE	No spillway or outlet structure exists, only dewatering pump.		
7.1 Surface Condition	.		
7.2 Signs of Erosion			

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
7.3 Signs of Movement (Deformation)			
7.4 Cracks			
7.5 Settlement			
7.6 Presence of Debris or Blockage			
7.7 Closure mechanism operational			
7.8 Slope Protection			
7.9 Instability of Side Slopes			
7.10 Other Unusual Conditions			
8. INSTRUMENTATION			
8.1 Piezometers	No		
8.2 Settlement Cells	No		
8.3 Thermistors	Yes		See Section 5.6.2 of the report.
8.4 Settlement Monuments	No		
8.5 Seismograph	No		
8.6 Inclinometer	No		
8.7 Weirs and Flow Monitors	No		
8.8 Data logger(s)	Yes		
8.9 Other			
9. DOCUMENTATION			
9.1 Operation, Maintenance and Surveillance (OMS) Plan			
9.1.1 OMS Plan exists	Yes		
9.1.2 OMS Plan reflects current dam conditions	Yes		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
9.1.3 Date of last revision	March 2019		
9.2 Emergency Preparedness Plan (EPP)			
9.2.1 EPP exists	Yes		
9.2.2 EPP reflects current conditions	Yes		
9.2.3 Date of last revision	June 2020		
10. NOTES :			

Inspector's Signature	Marion Habersetzer	**Date:**	July 14, 2020



Photograph B5-1 Saddle Dam 3

Date: July 14, 2020 **Photo Number**: 120

Description: From Sta. 20+750, looking northwest at the downstream slope and toe.



Photograph B5-2 Saddle Dam 3

Date: July 14, 2020 **Photo Number**: 119

Description: From Sta. 20+700, looking southeast at the crest.



Photograph B5-3 Saddle Dam 3

Date: July 14, 2020 **Photo Number**: 118

Description: From Sta. 20+700, looking northwest at the crest.



Photograph B5-4 Saddle Dam 3

Date: July 14, 2020 **Photo Number**: 117

Description: From Sta. 20+610, looking south at the upstream slope.

APPENDIX B6

Saddle Dam 4

Client:	AEM	**By:**	Marion Habersetzer
Project:	Meadowbank	**Date:**	July 14, 2020
Location:	Saddle Dam 4	**Reviewed:**	Yves Boulianne

GENERAL INFORMATION			
Dam Type:	Rockfill embankment with inverted filter on base, upstream filters, a geomembrane liner tied in a toe till plug and upstream till blanket.		
Weather Conditions:	Rainy	**Temperature:**	10°C

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1. DAM CREST		146, 147, 149, 150, 151, 152	
1.1 Crest elevation	145 m		Designed to be able to be raised to El. 150 m
1.2 Reservoir Level	141.09 m - water 144.5 m - tailings		
Current Freeboard	3.9 m - water 0.5 m - tailings		
1.3 Distance To Tailings Pond (if applicable)	Approx. 100 m		
1.4 Surface Cracking	None at time of inspection		
1.5 Unexpected Settlement	None observed		
1.6 Lateral Movement	Not apparent		
1.7 Other Unusual Conditions	None		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
2. UPSTREAM SLOPE		146, 147, 148, 149	
2.1 Slope angle	3H:1V		
2.2 Signs of Erosion	None observed		
2.3 Signs of Movement (Deformation)	None observed		
2.4 Cracks	None observed		
2.5 Face liner condition (if applicable)	Good		
2.6 Other Unusual Conditions	None		
3. DOWNSTREAM SLOPE		150, 151, 152	
3.1 Slope angle	1.5H:1V		
3.2 Signs of Erosion	None observed		
3.3 Signs of Movement (Deformation)	None observed		
3.4 Cracks	None observed		
3.5 Seepage or Wet Areas	None observed on slope		
3.6 Vegetation Growth	None observed		
3.7 Other Unusual Conditions	None		
4. DOWNSTREAM TOE AREA		150, 151, 152	
4.1 Seepage from Dam	No		
4.2 Signs of Erosion	None observed		
4.3 Signs of Turbidity in Seepage Water	Not applicable		
4.4 Discoloration/staining	No		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
4.5 Outlet operating problem (if applicable)	Not applicable		
4.6 Other Conditions	Yes		Runoff water accumulate at the downstream side of the structure. It is pumped out so that the water level does not exceed the elevation of the granular layer of the upstream toe liner tie-in.
5. ABUTMENTS			
5.1 Seepage at contact zone (abutment/embankment)	None observed		Highly fractured bedrock observed at the western abutment.
5.2 Signs of Erosion	None observed		
5.3 Excessive Vegetation	No		
5.4 Presence of Rodent Burrows	None observed		
5.5 Other Unusual Conditions	None		
6. RESERVOIR		148	
6.1 Stability of Slopes	Stable		
6.2 Distance to Nearest Slide (if applicable)	None observed		
6.3 Estimate of Slide Volume (if applicable)	Not applicable		
6.4 Floating debris	None observed		
6.5 Other Unusual Conditions	None		
7. EMERGENCY SPILLWAY/ OUTLET STRUCTURE	No spillway or outlet structure exists, only dewatering pump.		
7.1 Surface Condition			
7.2 Signs of Erosion			

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
7.3 Signs of Movement (Deformation)			
7.4 Cracks			
7.5 Settlement			
7.6 Presence of Debris or Blockage			
7.7 Closure mechanism operational			
7.8 Slope Protection			
7.9 Instability of Side Slopes			
7.10 Other Unusual Conditions			
8. INSTRUMENTATION			
8.1 Piezometers	No		
8.2 Settlement Cells	No		
8.3 Thermistors	Yes		See Section 5.6.2 of the report
8.4 Settlement Monuments	No		
8.5 Seismograph	No		
8.6 Inclinometer	No		
8.7 Weirs and Flow Monitors	No		Construction drawings indicate a seepage collection system is to be constructed.
8.8 Data logger(s)	Yes		
8.9 Other			
9. DOCUMENTATION			
9.1 Operation, Maintenance and Surveillance (OMS) Plan			
9.1.1 OMS Plan exists	Yes		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
9.1.2 OMS Plan reflects current dam conditions	Yes		
9.1.3 Date of last revision	March 2019		
9.2 Emergency Preparedness Plan (EPP)			
9.2.1 EPP exists	Yes		
9.2.2 EPP reflects current conditions	Yes		
9.2.3 Date of last revision	June 2020		
10. NOTES :			

Inspector's Signature	Marion Habersetzer	**Date:**	July 14, 2020



Photograph B6-1 Saddle Dam 4

Date: July 14, 2020 **Photo Number**: 150

Description: From 40+220 approximately, looking southeast at the crest and the downstream slope and toe.



Photograph B6-2 Saddle Dam 4

Date: July 14, 2020 **Photo Number**: 148

Description: From 40+150 approximately, looking northeast at the upstream slope and the South Cell.



Photograph B6-3 Saddle Dam 4

Date: July 14, 2020 **Photo Number**: 149

Description: From 40+150 approximately, looking southeast at the crest and the upstream slope.



Photograph B6-4 Saddle Dam 4

Date: July 14, 2020 **Photo Number**: 146

Description: From 40+250 approximately, looking northwest at the crest and the upstream slope.



Photograph B6-5 Saddle Dam 4

Date: July 14, 2020 **Photo Number**: 147

Description: From 40+250 approximately, looking southeast at the crest and the upstream slope. Presence of a pipe on the liner.



Photograph B6-6 Saddle Dam 4

Date: July 14, 2020 **Photo Number**: 151

Description: From 40+400 approximately, looking southeast at the crest and the downstream slope and toe.



Photograph B6-7 Saddle Dam 4

Date: July 14, 2020 **Photo Number**: 152

Description: From 40+450 approximately, looking southeast at the crest and the downstream slope and toe.

APPENDIX B7

Central Dike - Saddle Dam 5

Client:	AEM	**By:**	Marion Habersetzer
Project:	Meadowbank	**Date:**	July 14, 2020
Location:	Central Dike and Saddle Dam 5	**Reviewed:**	Yves Boulianne

GENERAL INFORMATION			
Dam Type:	Rockfill embankment with inverted filter on base, key trench, upstream filters, a geomembrane liner tied in a toe till plug and protective cover.		
Weather Conditions:	Rainy	**Temperature:**	10°C

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1. DAM CREST		154, 155, 157, 159, 160, 161, 162, 163	
1.1 Crest Elevation	Cofferdam Crest = 110 m Rockfill crest = 145 m		
1.2 Reservoir Level	141.09 m - water 144.56 m - tailings		
Current Freeboard	3.9 m - water 0.44 m - tailings		
1.3 Distance To Tailings Pond (if applicable)	Variable		Adequate tailings beach against Central Dike, except south of Sta. 0+850, where water is ponding against the Central Dike and Saddle Dam 5.
1.4 Surface Cracking	None at time of inspection		
1.5 Unexpected Settlement	None observed		
1.6 Lateral Movement	Not apparent		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
1.7 Other Unusual Conditions			
2. UPSTREAM SLOPE		154, 155, 157, 159, 160, 163, 164	
2.1 Slope angle	3:1V up to El. 130 m and 2H:1V above		
2.2 Signs of Erosion	None observed		
2.3 Signs of Movement (Deformation)	None observed		
2.4 Cracks	None observed		
2.5 Face liner condition (if applicable)			Liner covered by a granular protection layer up to El. 128 m and well protected underneath deposition fingers. Presence of gravel on the liner at Sta. 0+750 m and of a cable with a metallic plug at Sta. 0+900 m.
2.6 Other Unusual Conditions	None		
3. DOWNSTREAM SLOPE		153, 156, 158	
3.1 Slope angle	1.5H		
3.2 Signs of Erosion	None observed		
3.3 Signs of Movement (Deformation)	None observed		
3.4 Cracks	None observed		
3.5 Seepage or Wet Areas			
3.6 Vegetation Growth	None observed		
3.7 Other Unusual Conditions	None		

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
4. DOWNSTREAM TOE AREA		153, 156, 158	
4.1 Seepage from Dam	Yes		Presence of a water pond formed by seepage on the downstream side between the downstream toe and West Road (0+300 to 0+830 approximately). The pond is pumped back to the South Cell and maintained at El. 115 m. The pumping rate was 110 m^3/hr at the time of the inspection.
4.2 Signs of Erosion	None observed		
4.3 Signs of Turbidity in Seepage Water	Yes		High turbidity events observed in the pond and an orange coloration was observed periodically.
4.4 Discoloration/staining	No		
4.5 Outlet operating problem (if applicable)	Not applicable		
4.6 Other Unusual Conditions			
5. ABUTMENTS			
5.1 Seepage at contact zone (abutment/embankment)	None observed		
5.2 Signs of Erosion	None observed		
5.3 Excessive Vegetation	No		
5.4 Presence of Rodent Burrows	None observed		
5.5 Other Unusual Conditions	None		
6. RESERVOIR		164	

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
6.1 Stability of Slopes	Stable		
6.2 Distance to Nearest Slide	None observed		
6.3 Estimate of Slide Volume (if applicable)	Not applicable		
6.4 Floating debris	None observed		
6.5 Other Unusual Conditions	None		
7. EMERGENCY SPILLWAY/ OUTLET STRUCTURE	No spillway or outlet structure exists, only dewatering pump.		
7.1 Surface Condition			
7.2 Signs of Erosion			
7.3 Signs of Movement (Deformation)			
7.4 Cracks			
7.5 Settlement			
7.6 Presence of Debris or Blockage			
7.7 Closure mechanism operational			
7.8 Slope Protection			
7.9 Instability of Side Slopes			
7.10 Other Unusual Conditions			
8. INSTRUMENTATION			
8.1 Piezometers	Yes		See Sections 5.6.2 and 5.7.2 of the report.

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
8.2 Settlement Cells	No		
8.3 Thermistors	Yes		See Section 5.0 of the report.
8.4 Settlement Monuments	No		
8.5 Seismograph	No		
8.6 Inclinometer	No		
8.7 Weirs and Flow Monitors	No		
8.8 Data logger(s)	Yes		
8.9 Other			
9. DOCUMENTATION			
9.1 Operation, Maintenance and Surveillance (OMS) Plan			
9.1.1 OMS Plan exists	Yes		
9.1.2 OMS Plan reflects current dam conditions	Yes		
9.1.3 Date of last revision	March 2019		
9.2 Emergency Preparedness Plan (EPP)			
9.2.1 EPP exists	Yes		
9.2.2 EPP reflects current conditions	Yes		
9.2.3 Date of last revision	June 2020		
10. NOTES :			

INSPECTION ITEM	OBSERVATIONS DATA	PHOTO	COMMENTS & OTHER DATA
Inspector's Signature	Marion Habersetzer	**Date:**	July 14, 2020



Photograph B7-1 Central Dike and Saddle Dam 5

Date: July 14, 2020 **Photo Number**: 164
Description: From approximately Sta. 0+400 (deposition point) looking west at the South Cell. Adequate tailings beach against the south section of the structure.



Photograph B7-2 Central Dike and Saddle Dam 5

Date: July 14, 2020 **Photo Number**: 163
Description: From approximately Sta. 0+400 (deposition point) looking south at the upstream slope. Adequate tailings beach against the south section of the structure.



Photograph B7-3 Central Dike and Saddle Dam 5

Date: July 14, 2020 **Photo Number**: 161

Description: From approximately Sta. 0+720 looking south at the crest.



Photograph B7-4 Central Dike and Saddle Dam 5

Date: July 14, 2020 **Photo Number**: 162

Description: From approximately Sta. 0+720 looking north at the crest.



Photograph B7-5 Central Dike and Saddle Dam 5

Date: July 14, 2020 **Photo Number**: 159

Description: From approximately Sta. 0+720 looking south at the crest and the upstream slope.



Photograph B7-6 Central Dike and Saddle Dam 5

Date: July 14, 2020 **Photo Number**: 160

Description: From approximately Sta. 0+720 looking north at the crest and the upstream slope.



Photograph B7-7 Central Dike and Saddle Dam 5

Date: July 14, 2020 **Photo Number**: 158

Description: From approximately Sta. 0+800, looking north at the downstream slope and toe.



Photograph B7-8 Central Dike and Saddle Dam 5

Date: July 14, 2020 **Photo Number**: 157

Description: From approximately Sta. 0+800, looking north at the crest and the upstream slope.



Photograph B7-9 Central Dike and Saddle Dam 5

Date: July 14, 2020 **Photo Number**: 153
Description: From approximately Sta. 0+900 downstream, looking north at the downstream pond.



Photograph B7-10 Central Dike and Saddle Dam 5

Date: July 14, 2020 **Photo Number**: 154

Description: From approximately Sta. 1+050 looking west at the upstream slope of SD5. Water is ponding against the liner.



Photograph B7-11 Central Dike and Saddle Dam 5

Date: July 14, 2020 **Photo Number**: 155

Description: From approximately Sta. 1+000 looking east at the upstream slope of SD5 and Central Dike. Water is ponding against the liner.



Photograph B7-12 Central Dike and Saddle Dam 5

Date: July 14, 2020 **Photo Number**: 156

Description: From approximately Sta. 1+100 looking southeast at the downstream slope and toe of SD5. Water is ponding at the toe.

APPENDIX C

Instrumentation Data

AMARUQ DIKES

MONTHLY INSTRUMENTATION REPORT

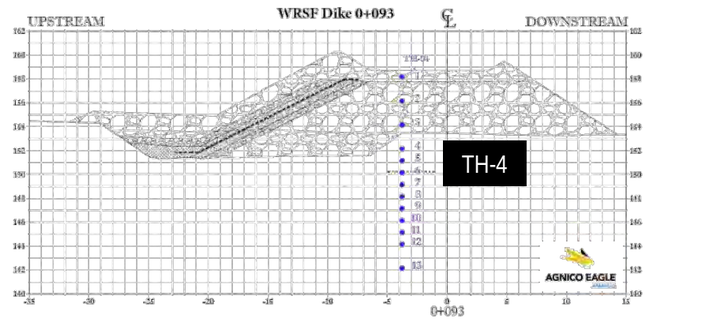
2020-09-07

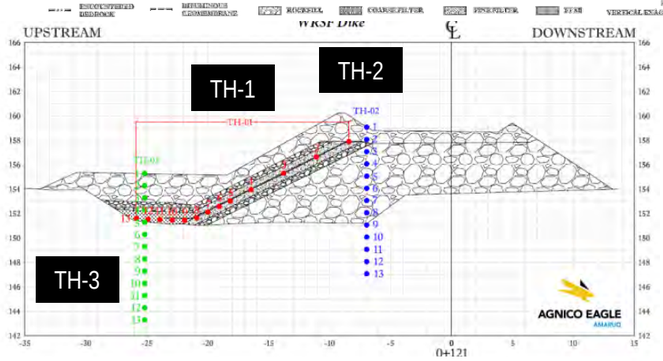
Prepared by: Laurier Collette

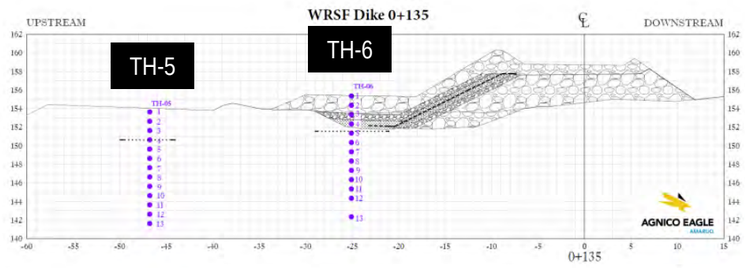
WRSF DIKE

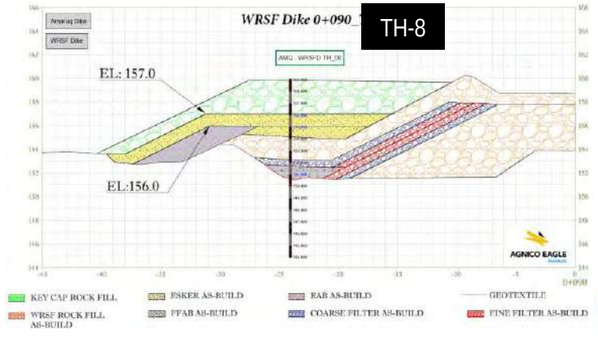
PLAN VIEW & CROSS-SECTIONS

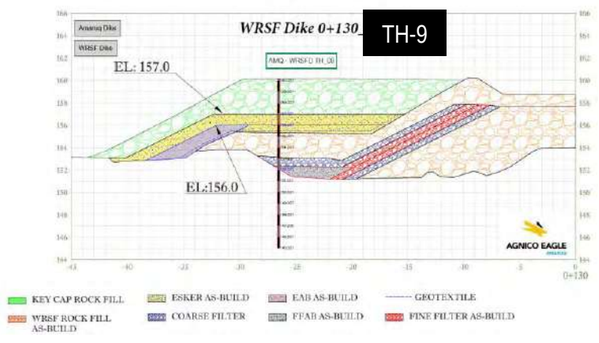


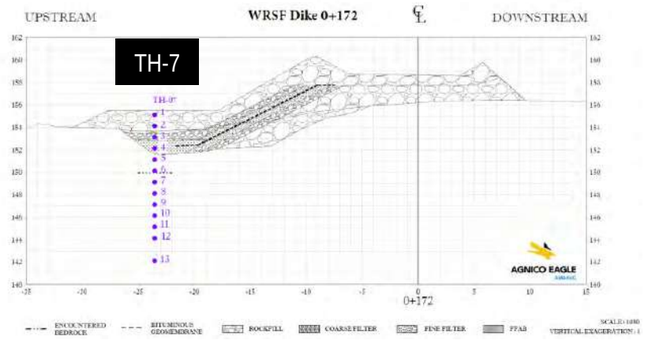












WRSF DIKE

STATUS OVERVIEW

Type	ID	Status 1	Status 2
Thermistors	WRSFD-TH-01	Operational	Slow increase
Thermistors	WRSFD-TH-02	Operational	Normal trend
Thermistors	WRSFD-TH-03	Operational	Slow increase
Thermistors	WRSFD-TH-04	Operational	Normal trend
Thermistors	WRSFD-TH-05	Operational	Normal trend
Thermistors	WRSFD-TH-06	Operational	Slow increase
Thermistors	WRSFD-TH-07	Operational	Normal trend
Thermistors	WRSFD-TH-08	Operational	Normal trend
Thermistors	WRSFD-TH-09	Operational	Normal trend

WRSF DIKE

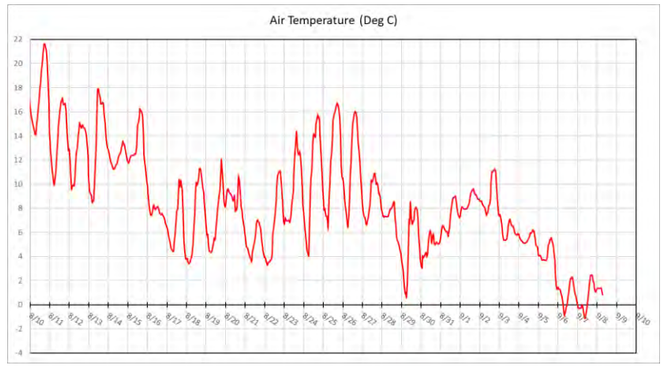
GENERAL COMMENTS

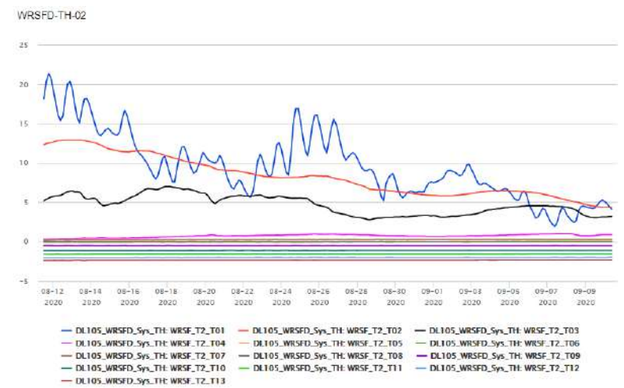
- Mix of seasonal slow warming and cooling trends. Temperature is still warming at depth. It started cooling near the surface consistently with air temperature
- Temperature at beads near surface is more sensitive to air temperature variations.
- Data from thermistor string along the liner shows that the fine filter is partially unfrozen

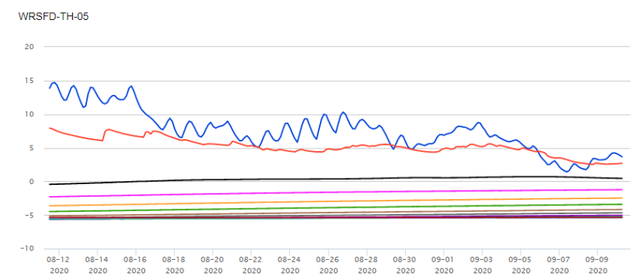
HIGHLIGHTS

(Detailed over the next pages)

1. Frozen conditions at depth (frozen bedrock, key trench FFAB & till, and all material below US thermal cap)
2. Warmer temperature at depth than last year for August, where data is available (TH1 & TH3)
3. Cooler & more stable temperature within the dike than last year same period
4. Some upper beads show minor spikes in temperature, related to rain events





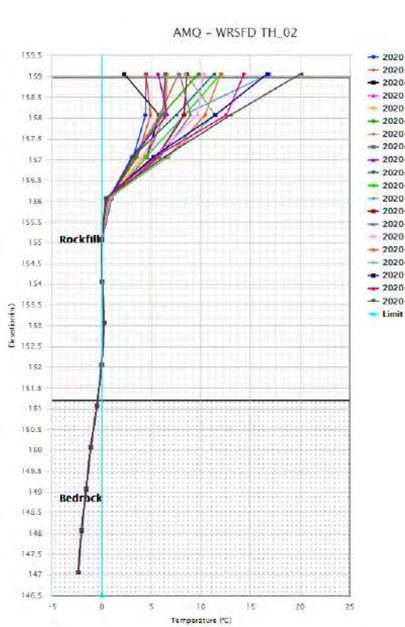


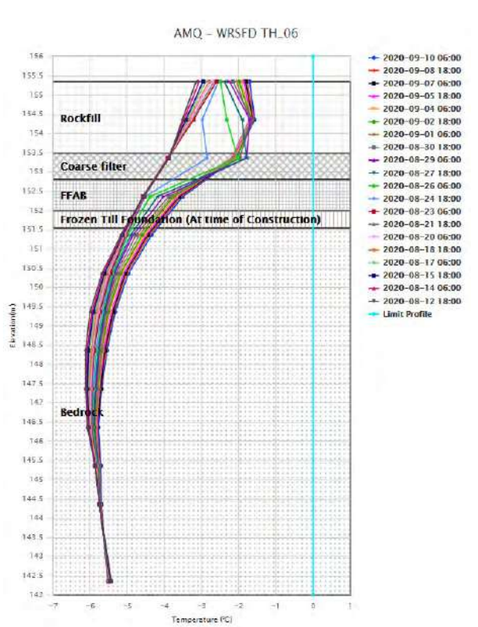
WRSF DIKE

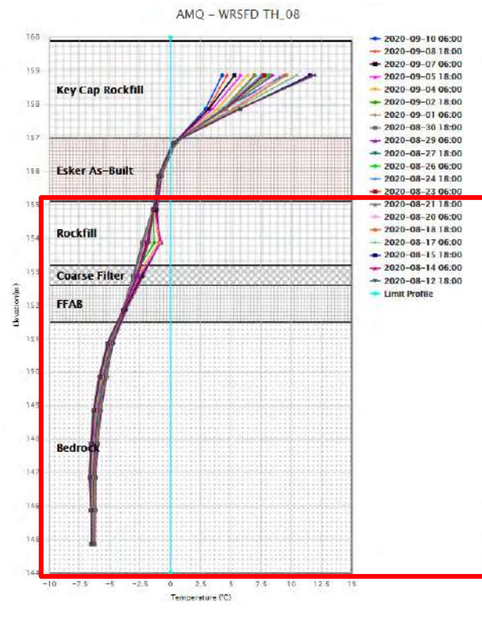
HIGHLIGHT #1 – Frozen conditions at depth

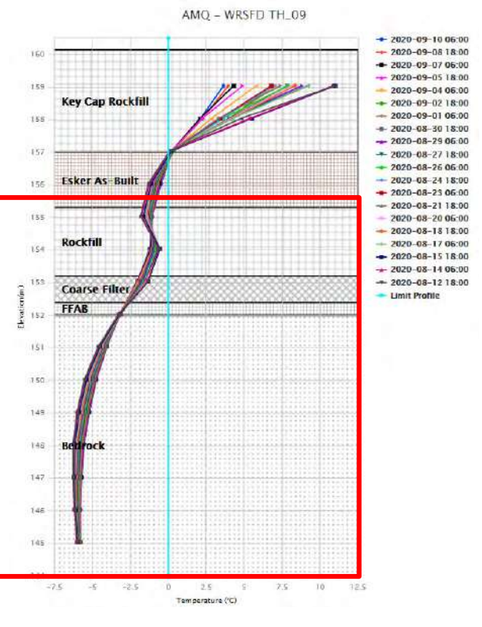
Additional comments:

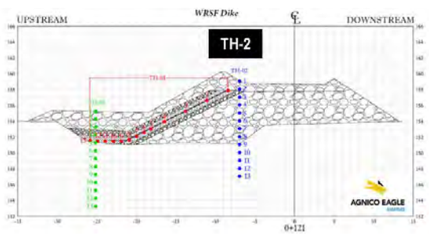
- The Bedrock is frozen at all instrument locations.
- FFAB and till foundation layers in the key trench are frozen at all instrument locations
- Temperature of the material under the upstream capping is remaining below zero according to TH8 & TH9. TH1 shows that the upper part of the fine filter, above el 155, is unfrozen/close to zero but the capping thickness at in that area is negligible.
- Bedrock temperature at TH2, TH4 is very stable (negligible temperature change over time)

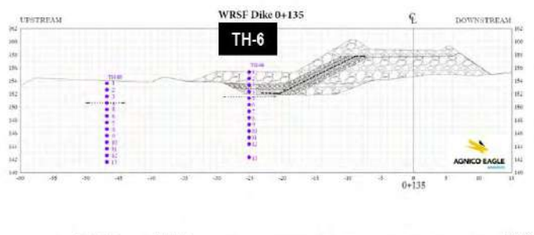


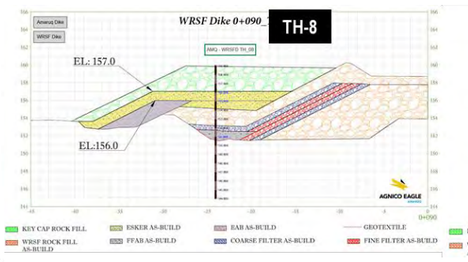


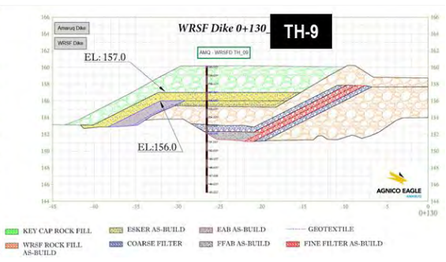








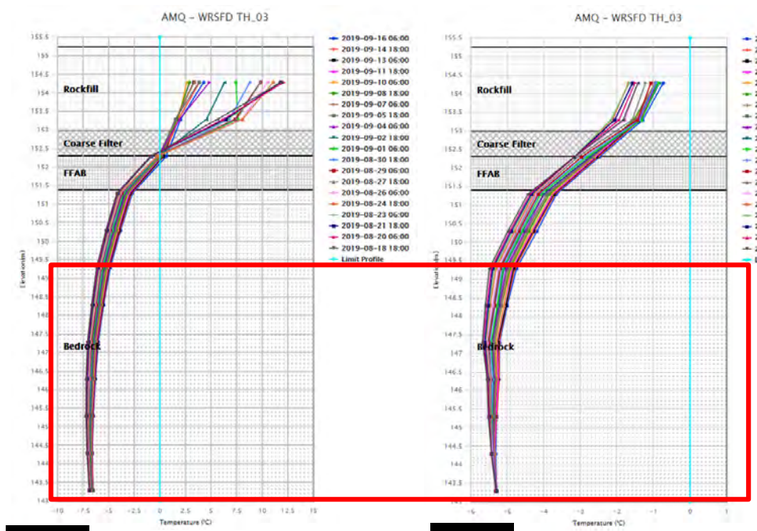


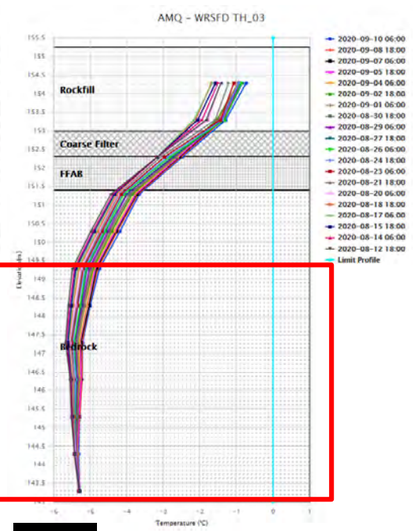


WRSF DIKE

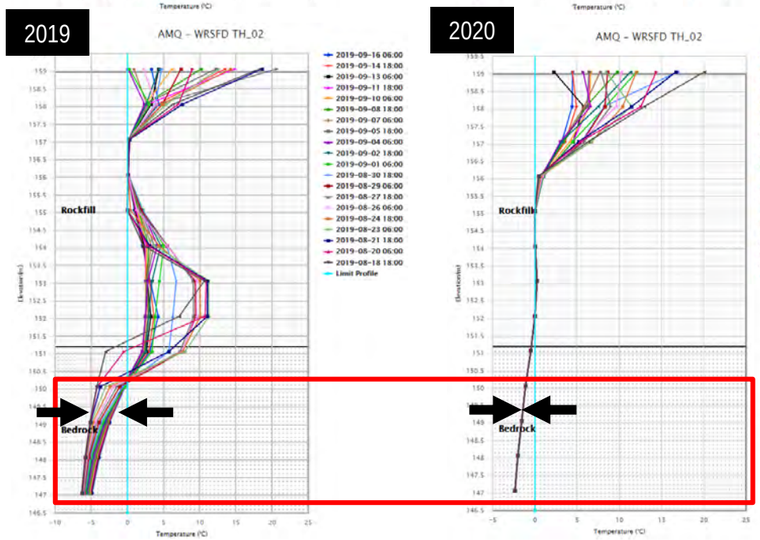
HIGHLIGHT #2 – Warmer temperature at depth than last year same period

Additional comments:
- Thermal profiles show warmer temperature at depth, in the bedrock, than last year for August, where data is available (TH1 & TH3)
- The temperature swing (temperature variation) at TH2 in the course of the same period is much less in 2020 than it was in 2021.

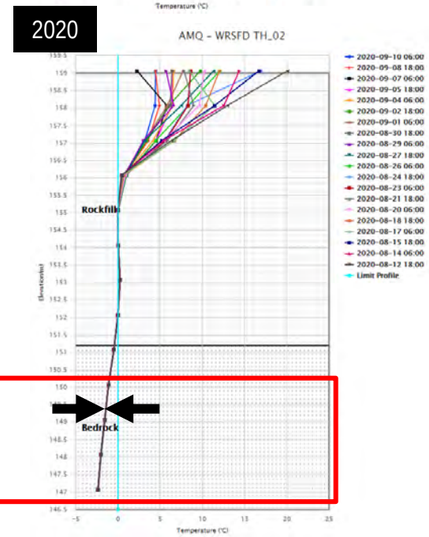


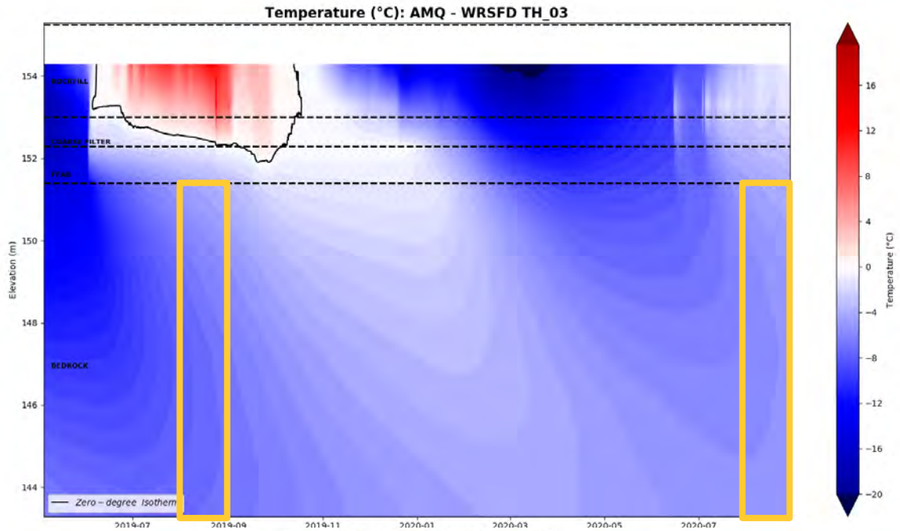


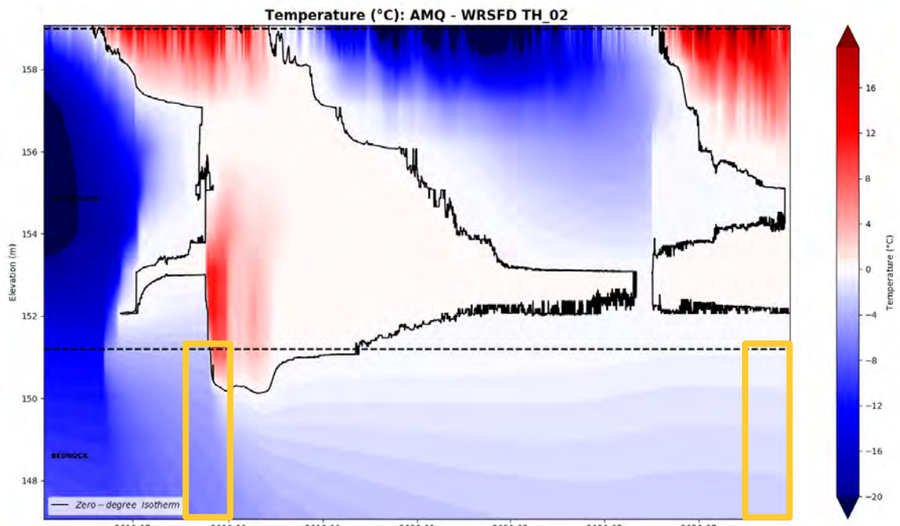
2019



2020



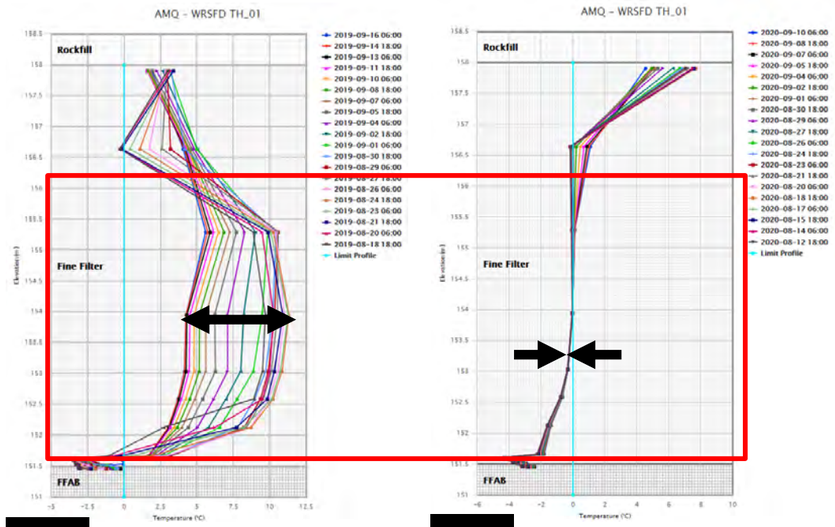


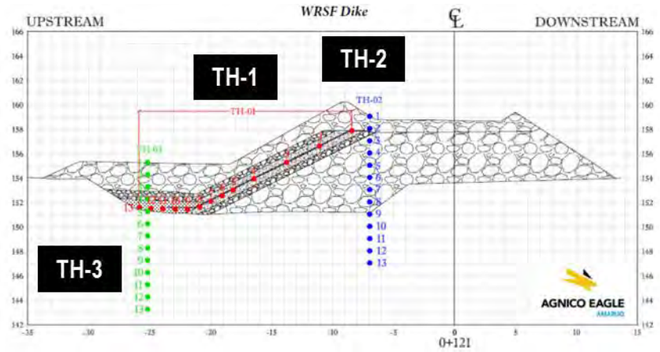


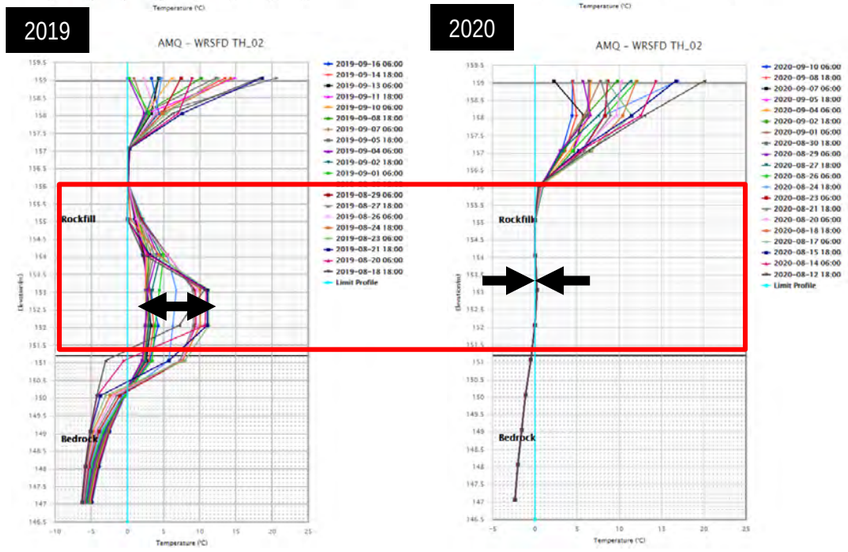
WRSF DIKE

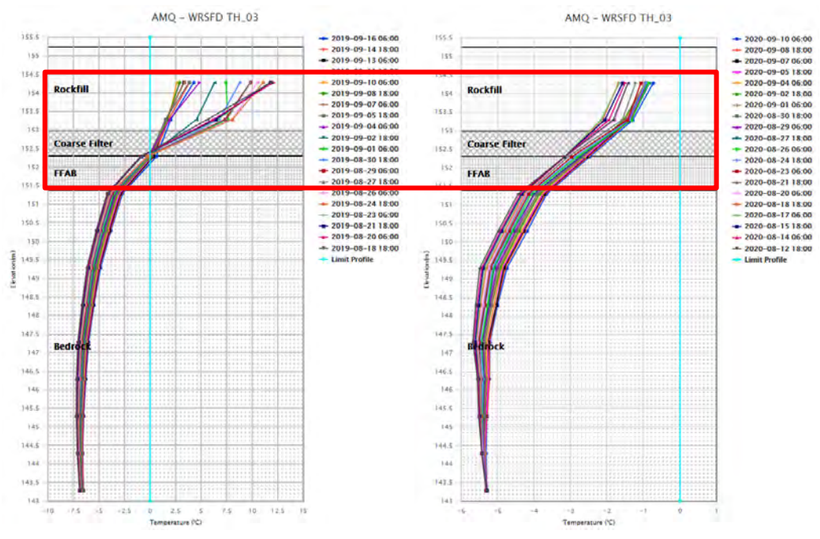
HIGHLIGHT #3 – Cooler & more stable temperature within the dike than last year same period

Additional comments:
- Thermal profiles show cooler temperature in the dike than last year for the same period, where data is available (TH1 & TH2)
- The temperature swing (temperature variation) in the course of the same period is less in 2020 than it was in 2021. More significant at TH1 &TH2.







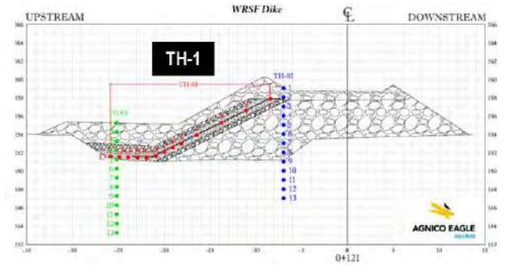


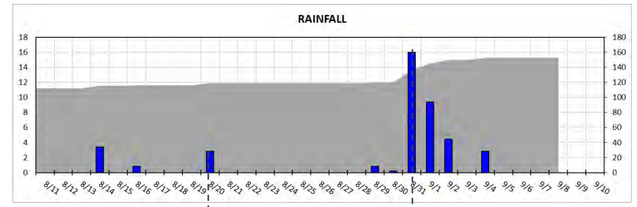
WRSF DIKE

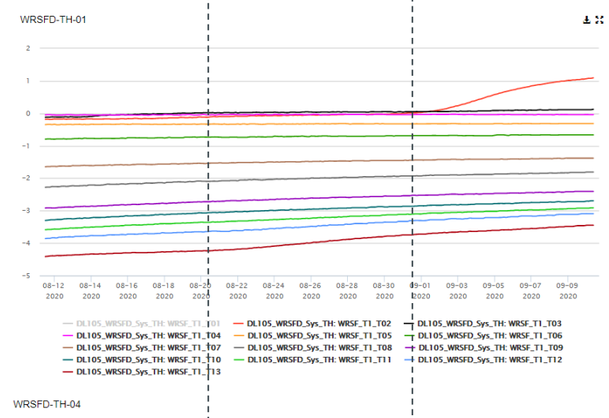
HIGHLIGHT #4 – Minor temperature spikes or increased warming following rainfall

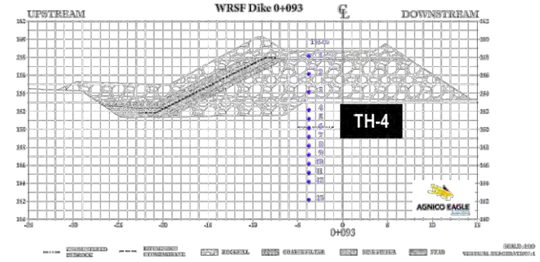
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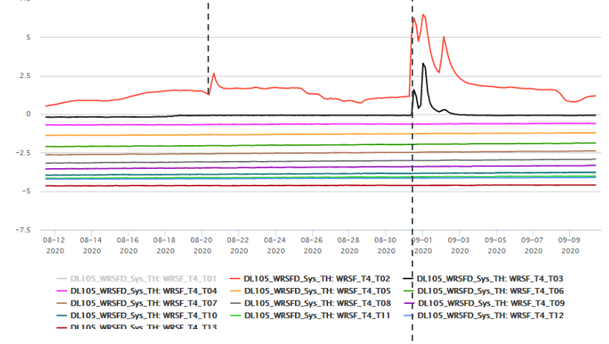
- Bead #2 (el 156.6) in TH1 within the liner is warming a bit more than other beads upon the latest rainfall events
- Upper beads at TH4 show quick reaction to rainfall events.
- Unlike other beads in TH8, bead #7 (el 153.9 - about 6m below surface, in the rockfill) seems to show increased warming triggered by rainfall infiltration. Lower beads also react slightly, with a delay. It looks like infiltrated water is making its way within the rockfill below the capping.

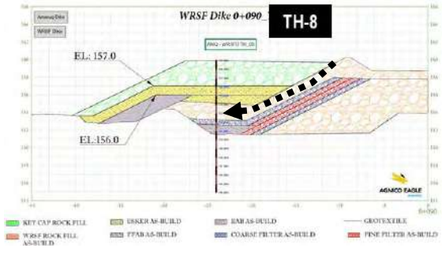


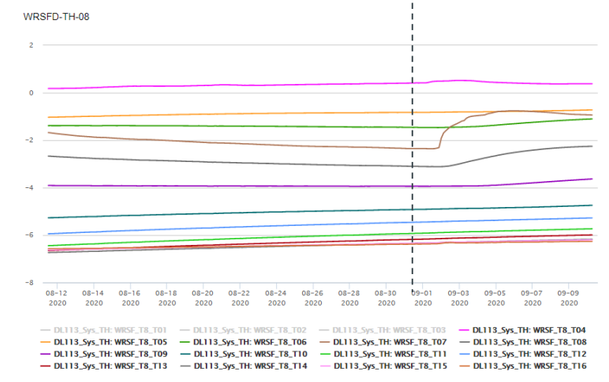








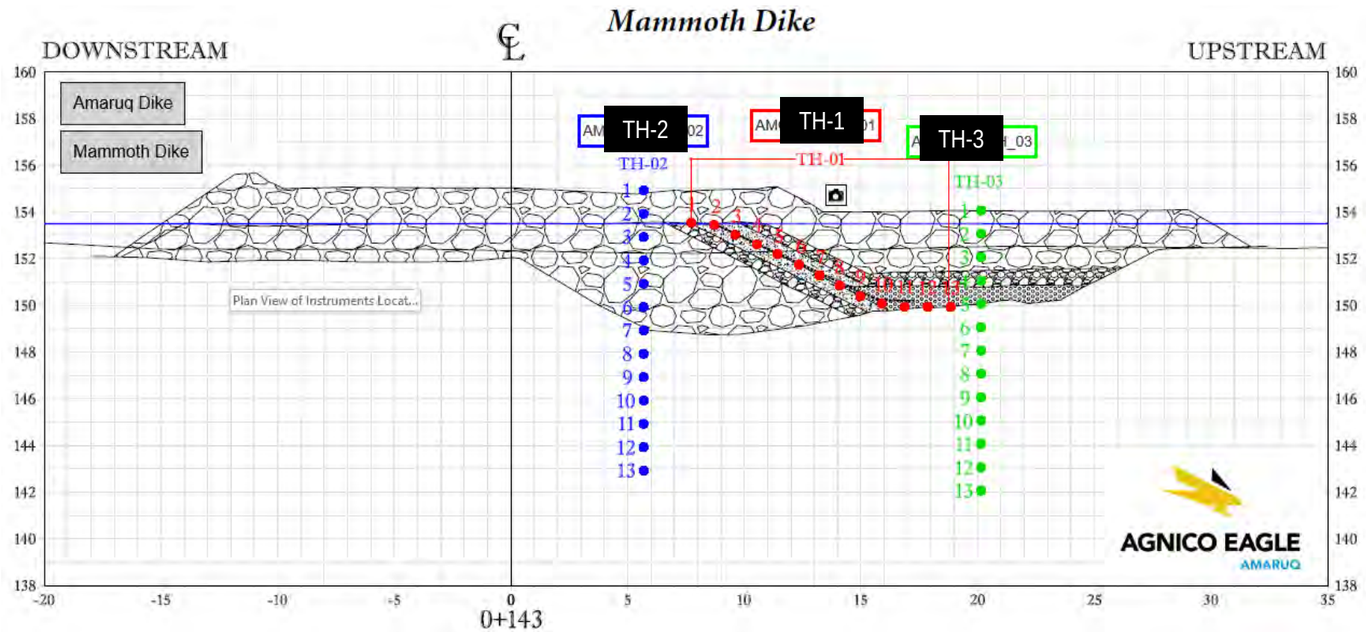




MAMMOTH DIKE

PLAN VIEW & CROSS-SECTION





MAMMOTH DIKE

STATUS OVERVIEW

Type	ID	Status 1	Status 2
Thermistors	MD-TH-01	Operational	Normal trend
Thermistors	MD-TH-01	Operational	Normal trend
Thermistors	MD-TH-03	Operational	Normal trend

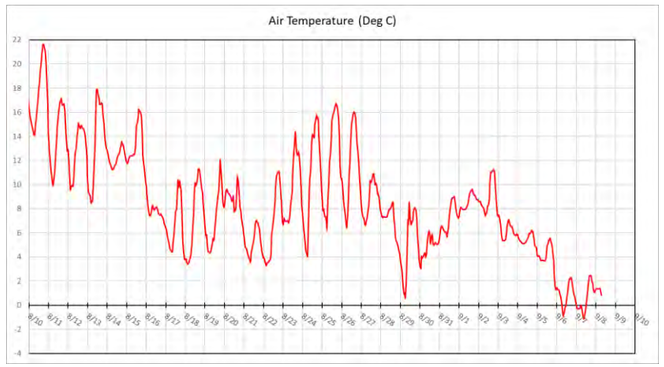
GENERAL COMMENTS

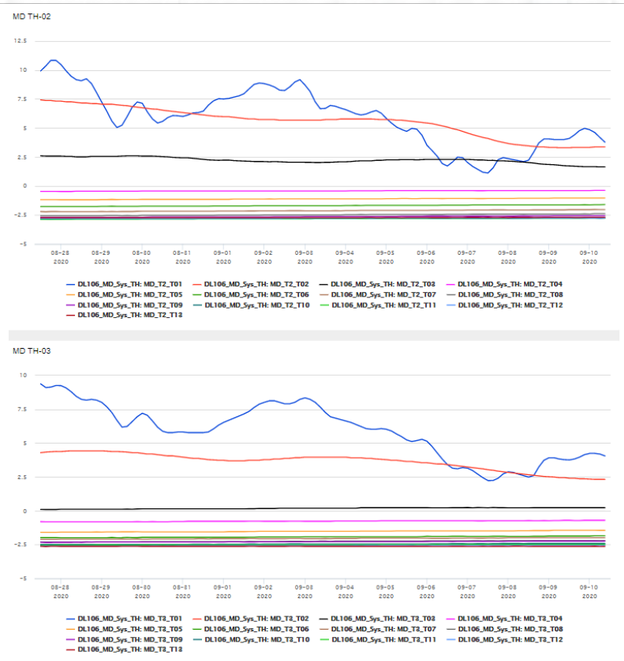
- Mix of seasonal slow warming and cooling trends. Temperature is still warming at depth. It started cooling near the surface consistently with air temperature.
- Temperature at beads near surface is more sensitive to air temperature variations. See figures on the right.
- Overall normal behavior

HIGHLIGHTS

(Detailed over the next pages)

1. Frozen conditions at depth (frozen bedrock & key trench)
2. Cooler & more stable temperature within the dike than last year same period

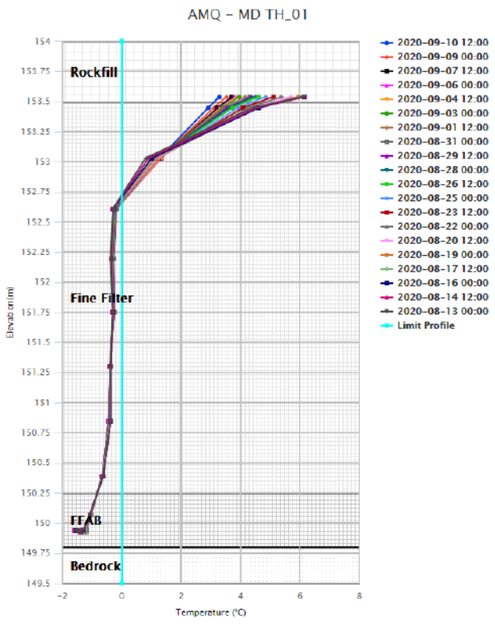


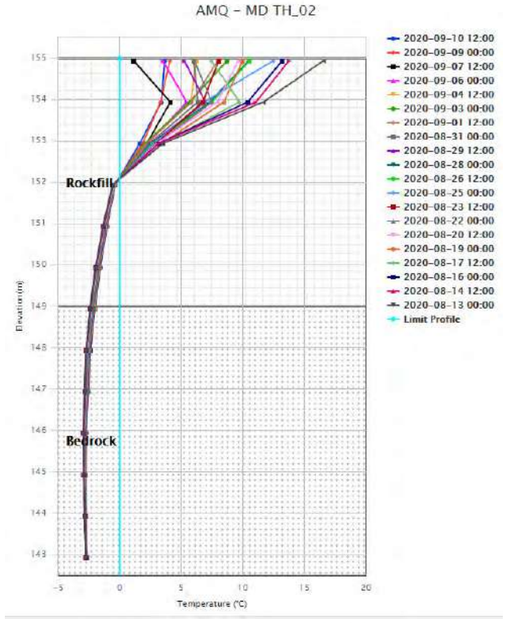


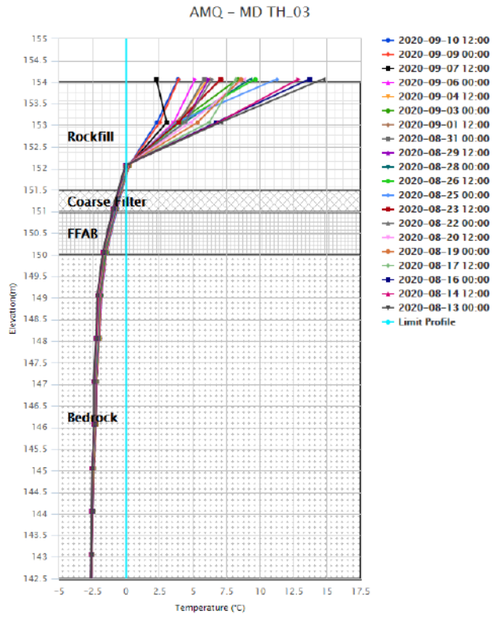
MAMMOTH DIKE

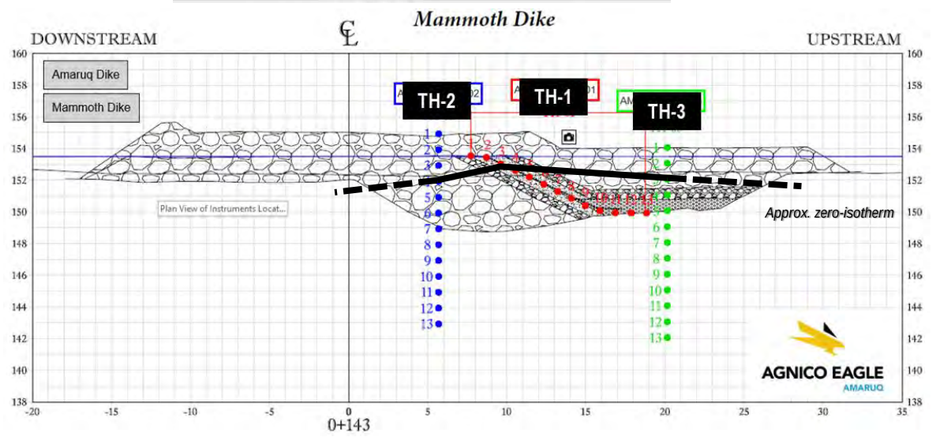
HIGHLIGHT #1 – Frozen conditions at depth

Additional comments:
- The Bedrock is frozen at all instrument locations.
- However, bedrock is slightly warmer (1-2 deg) than last year during the same period (TH2 & TH3)
- FFAB and filter layers in the key trench are frozen at all instrument locations





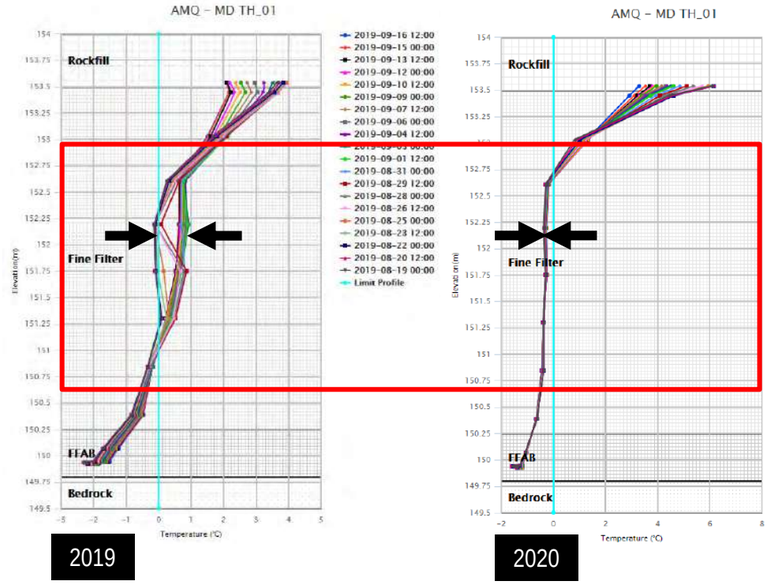




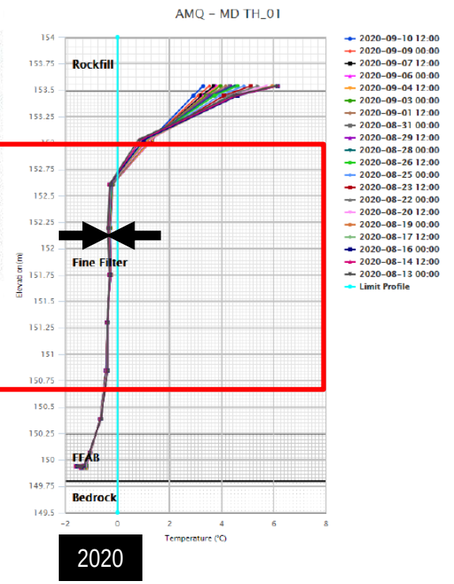
MAMMOTH DIKE

HIGHLIGHT #2 – Cooler & more stable temperature within the dike than last year same period

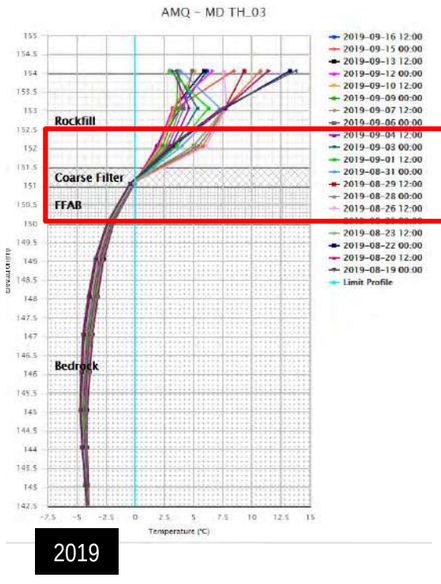
Additional comments:
- Thermal profiles show slightly cooler temperatures in the core of the dike than last year for the same period (TH1 & TH3)
- The temperature swing (temperature variation) in the course of the same period is less in 2020 than it was in 2021. More obvious at TH



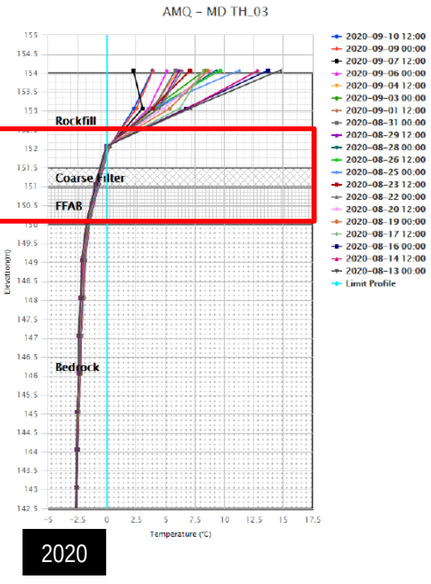
2019



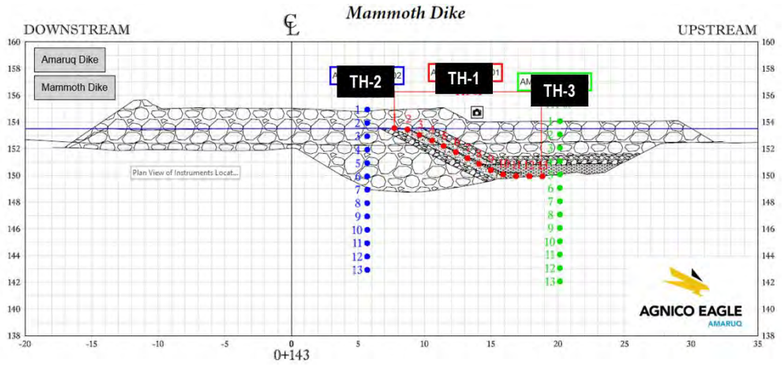
2020



2019

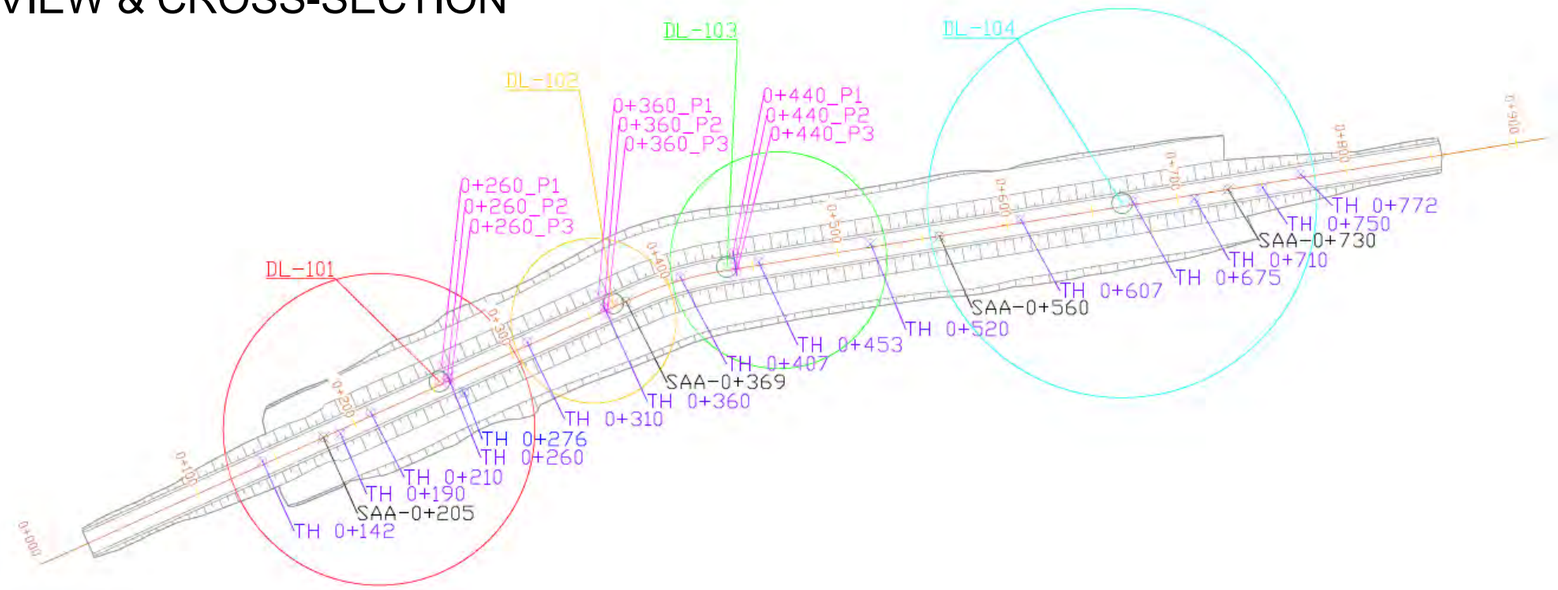


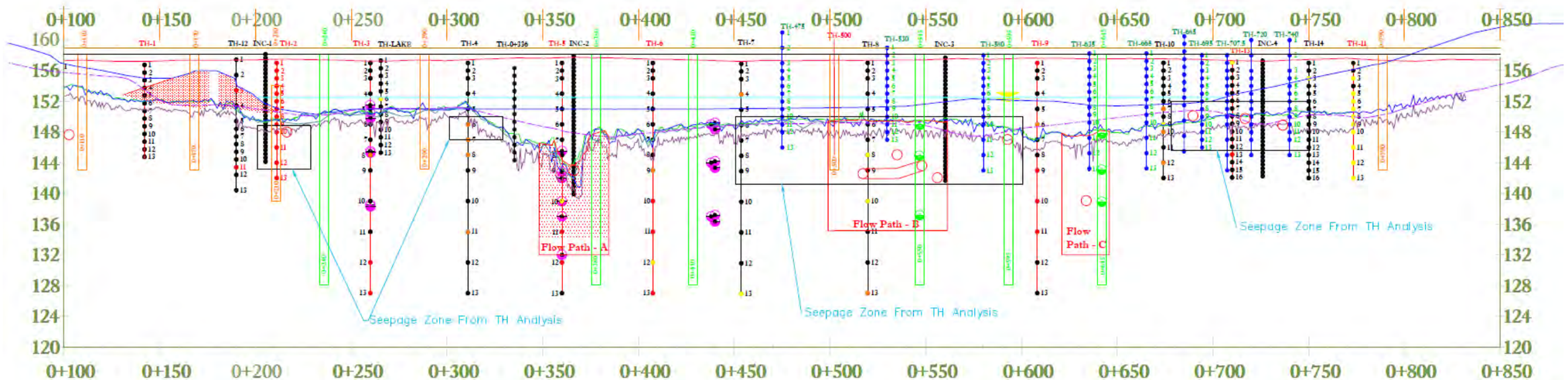
2020



WHALE TAIL DIKE

PLAN VIEW & CROSS-SECTION





WHALE TAIL DIKE

STATUS OVERVIEW

Type	ID	Status 1	Status 2
Thermistors	TH-0+142	Partially operational	Normal trend
Thermistors	TH-US-0+190	Operational	Normal trend
Thermistors	TH-0+260	Partially operational	Slow increase
Thermistors	TH-US-0+276	Operational	Normal trend
Thermistors	TH-0+310	Operational	Normal trend
Thermistors	TH-US-0+336	To be checked	Sharp increase
Thermistors	TH-0+360	Partially operational	Slow increase
Thermistors	TH-0+407	Partially operational	Slow increase
Thermistors	TH-0+453	Operational	Slow increase
Thermistors	TH-0+520	Partially operational	Normal trend
Thermistors	TH-0+607	Partially operational	Slow increase
Thermistors	TH-0+675	Operational	Slow increase
Thermistors	TH-US-0+710	Partially operational	Normal trend
Thermistors	TH-US-0+750	To be checked	Slow increase
Thermistors	TH-0+772	Partially operational	Known behavior
Piezometers	260-P1-A	Operational	Slow increase
Piezometers	260-P1-B	Operational	Slow decrease
Piezometers	260-P1-C	Operational	Slow decrease
Piezometers	260-P2-A	Operational	Slow decrease
Piezometers	260-P2-B	Operational	Slow decrease
Piezometers	260-P3-A	Operational	Slow decrease
Piezometers	260-P3-B	Operational	Slow decrease
Piezometers	260-P3-C	Operational	Slow decrease
Piezometers	360-P1-A	Operational	Slow decrease
Piezometers	360-P1-B	Operational	Slow decrease
Piezometers	360-P1-C	Operational	Sharp decrease
Piezometers	360-P2-A	Operational	Slow decrease
Piezometers	360-P2-B	Operational	Slow decrease
Piezometers	360-P2-C	Operational	Slow increase
Piezometers	360-P3-A	Operational	Slow decrease
Piezometers	360-P3-B	Operational	Slow decrease
Piezometers	360-P3-C	Operational	Sharp decrease

Type	ID	Status 1	Status 2
Piezometers	440-P1-A	Operational	Slow increase
Piezometers	440-P1-B	Operational	Slow increase
Piezometers	440-P1-C	Operational	Slow decrease
Piezometers	440-P2-A	Operational	Slow decrease
Piezometers	440-P2-B	Operational	Slow decrease
Piezometers	440-P2-C	Operational	Slow increase
Piezometers	440-P3-A	Operational	Slow decrease
Piezometers	440-P3-B	Operational	Slow decrease
Piezometers	440-P3-C	Operational	Slow increase
Inclinometers	SAA1-0+205	Operational	Slow increase
Inclinometers	SAA1-0+366	Operational	Slow increase
Inclinometers	SAA1-0+560	Operational	Slow increase
Inclinometers	SAA2-0+726	Operational	Slow increase

WHALE TAIL DIKE

GENERAL COMMENTS

- Mix of seasonal slow warming and cooling trends.
- Many thermistor strings have faulty/capacitive beads. New instrumentation campaign underway

HIGHLIGHTS

(Detailed over the next pages)

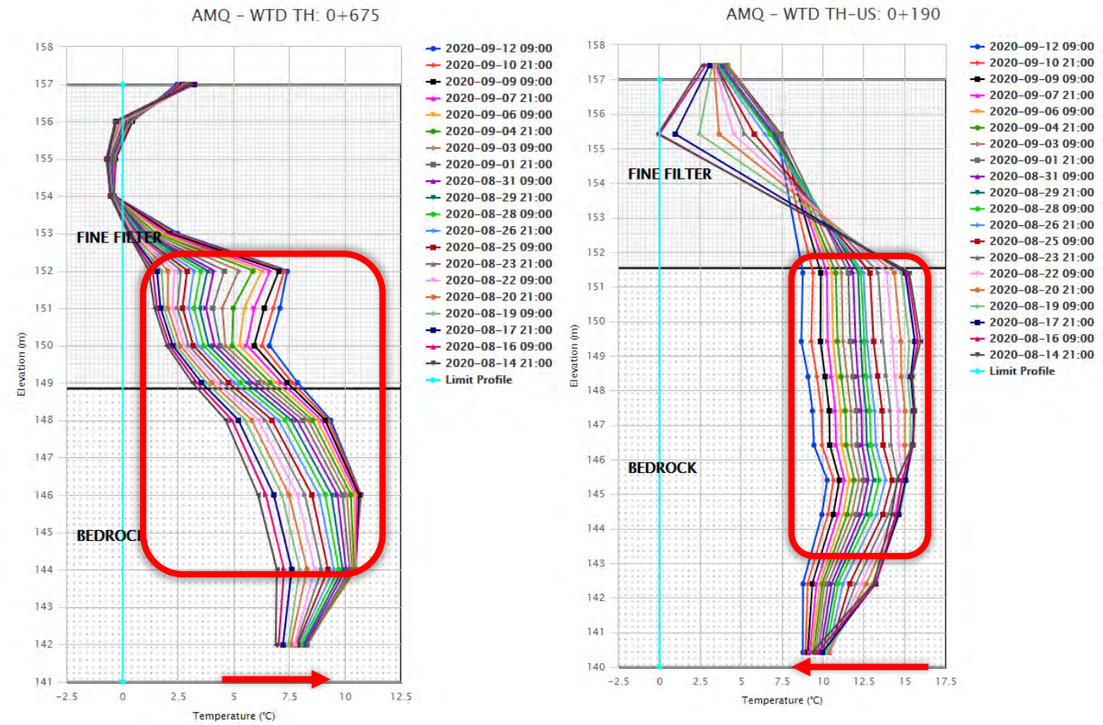
1. Warming trends in upper bedrock
2. Cooling trends in upper bedrock
3. A part of the fine filter remains frozen or close to zero
4. Some profiles show sharper warming & cooling
5. Some profiles show significantly higher temperature than last year same period
6. Water ingress signature in cutoff wall at mid-height 0+560 (update)
7. Most of the piezometers are hydraulically connected and react to both the water level in the lake and in the pond around P4 pumping well

WHALE TAIL DIKE

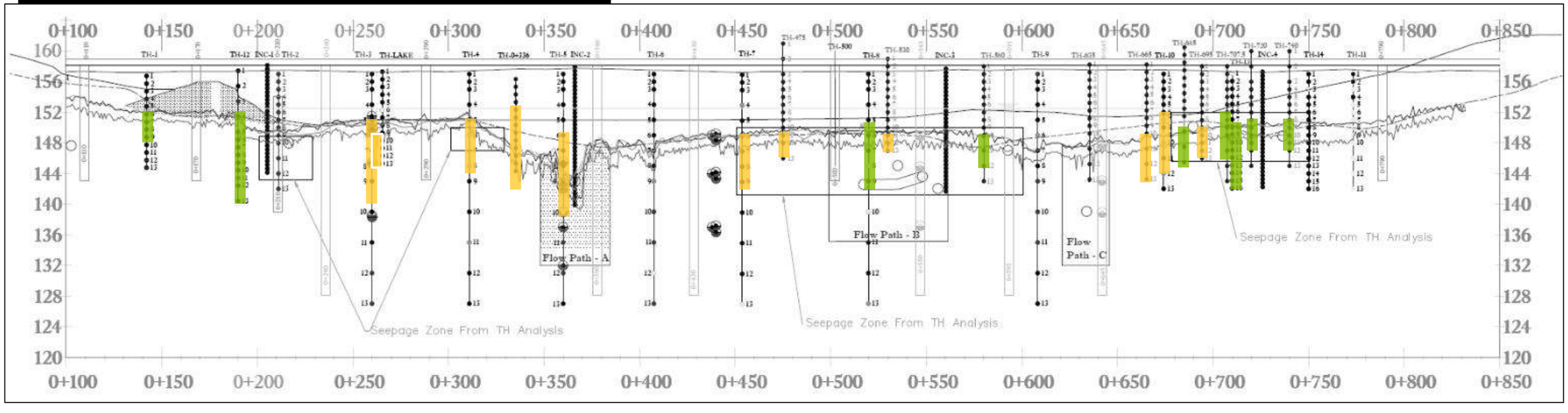
HIGHLIGHT #1 & 2 – Warming & cooling trend in upper bedrock

Additional comments:

- The upper bedrock is slowly warming according to thermistors:
  - 0+260
  - 0+276 (US)
  - 0+310
  - 0+336 (US)
  - 0+360
  - 0+407
  - 0+453
  - 0+675
  - 0+750 (US)
  - Temporary: 0+457, 0+530, 0+635, 0+665, 0+695
- The upper bedrock is slowly cooling according to thermistors:
  - 0+142
  - 0+190
  - 0+520
  - 0+710
  - Temporary: 0+580, 0+685, 0+707, 0+720, 0+740
- The lower part of the fine filter layer usually follows that trend as well.
- Magnitude of cooling trends is greater than that of warming, which make sense since the period is a the end of the warm summer season.
- Earlier cooling trends appears in previously identified seepage zone as shown on figure below.



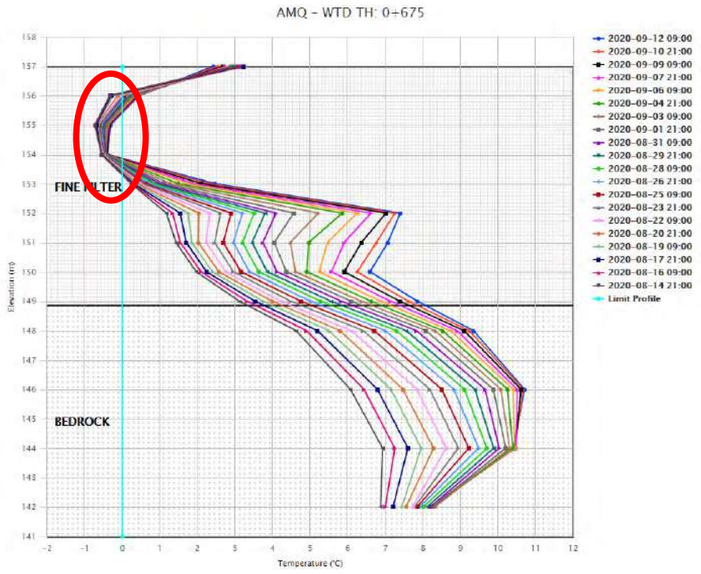
TH showing significant & obvious warming trends (Yellow) and cooling trends (green)

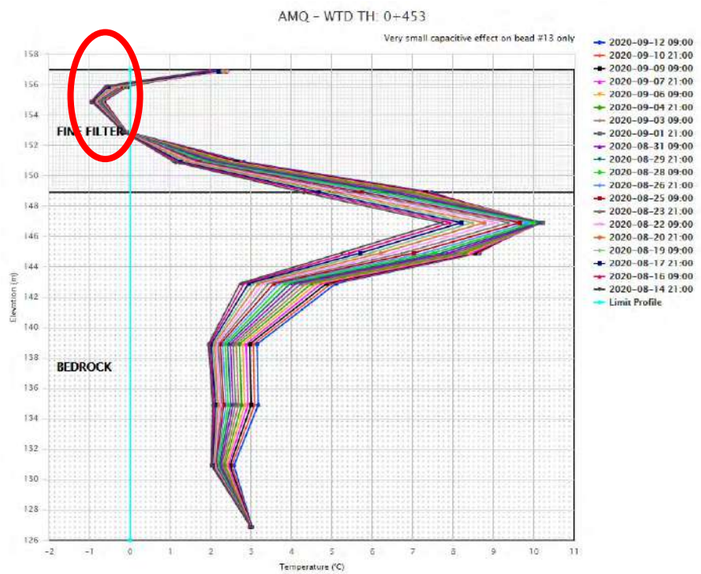


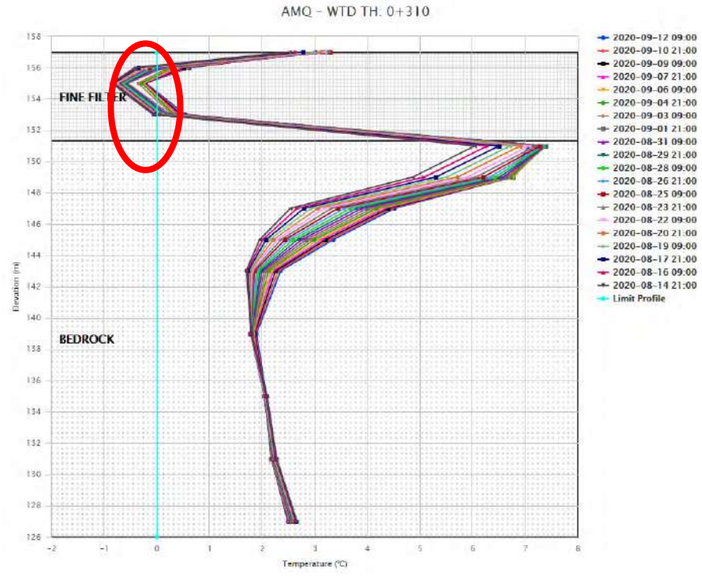
WHALE TAIL DIKE

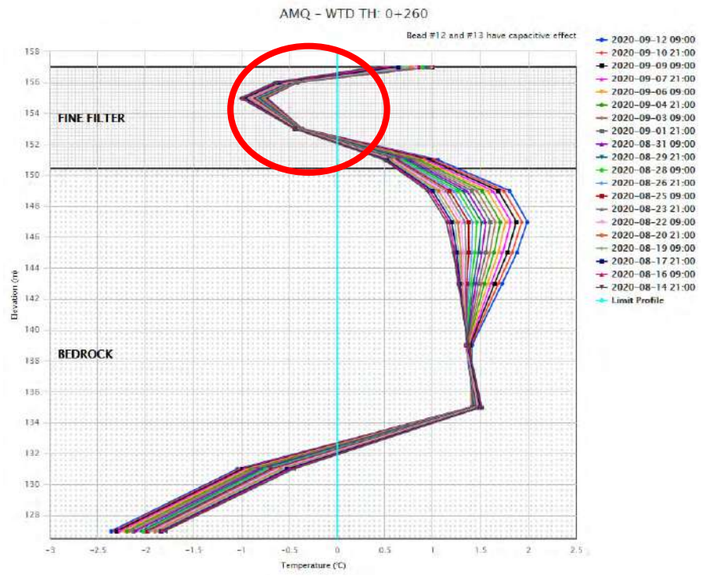
HIGHLIGHT #3 – A part of the fine filter remains frozen or close to zero

Additional comments:
- In almost all TH, a few beads in the upper part of the fine filter layer show that it is still frozen or close to zero. Examples are shown below.
- Exceptions are 0+190, 0+276





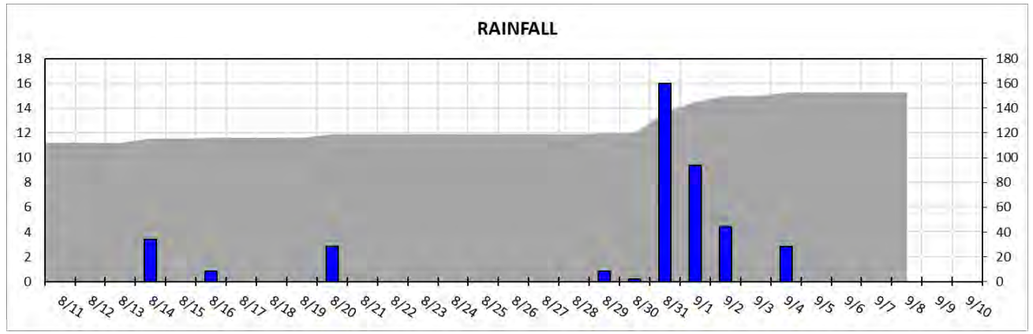


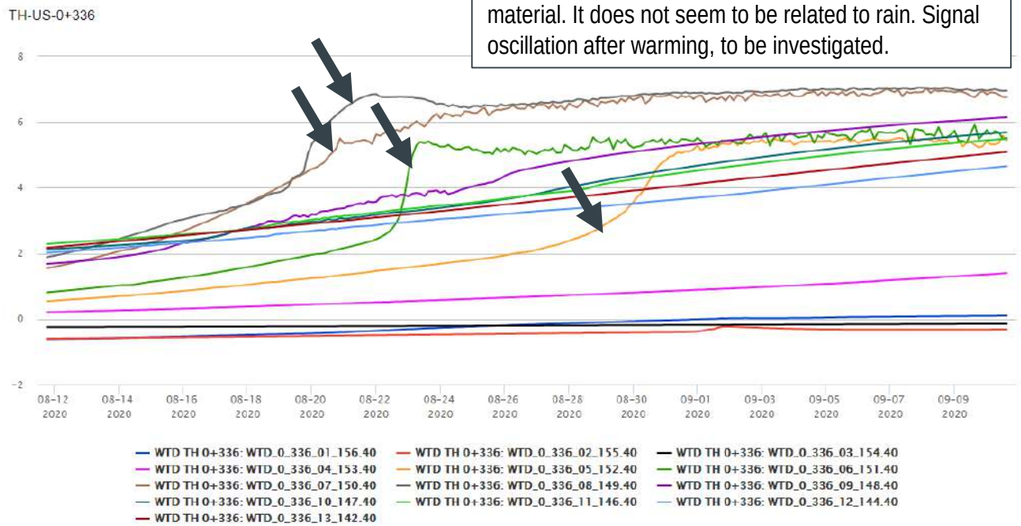


WHALE TAIL DIKE

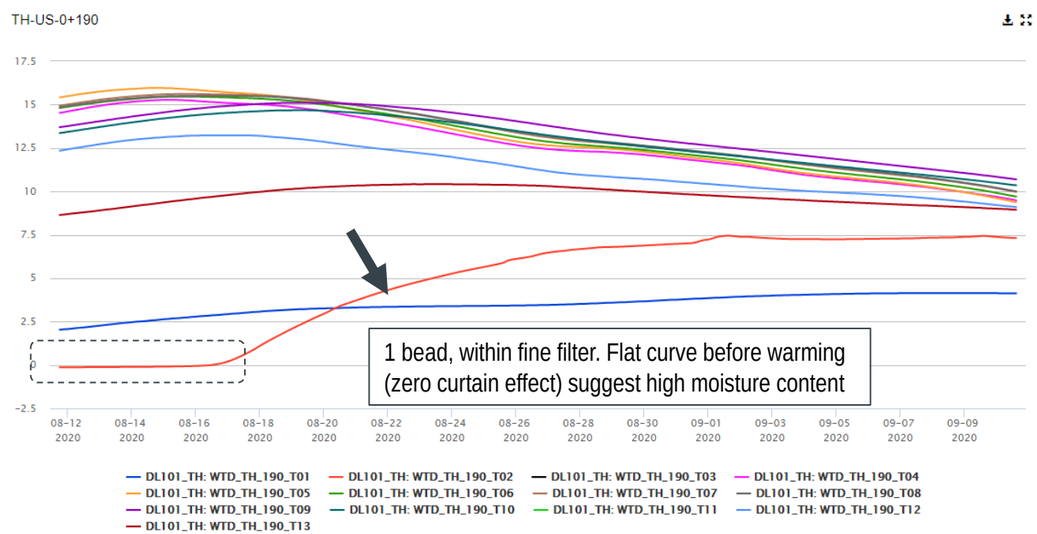
HIGHLIGHT #4 – Some profiles show sharper cooling trends

Additional comments:
- As highlighted on the figures below, some beads show more unusual and sharper warming trends.

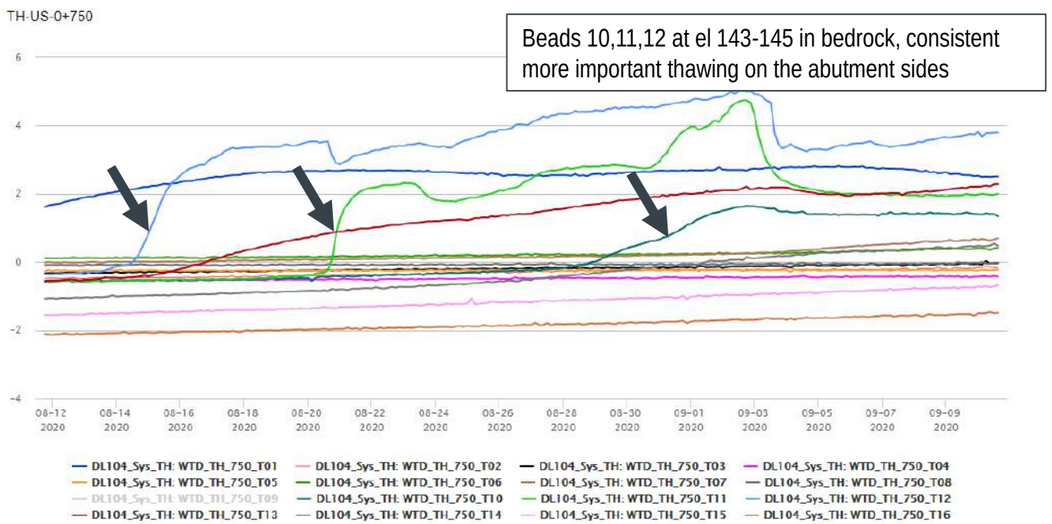




Beads 5,6,7,8 around el 149.5-152.5 within fine filter material. It does not seem to be related to rain. Signal oscillation after warming, to be investigated.



1 bead, within fine filter. Flat curve before warming (zero curtain effect) suggest high moisture content



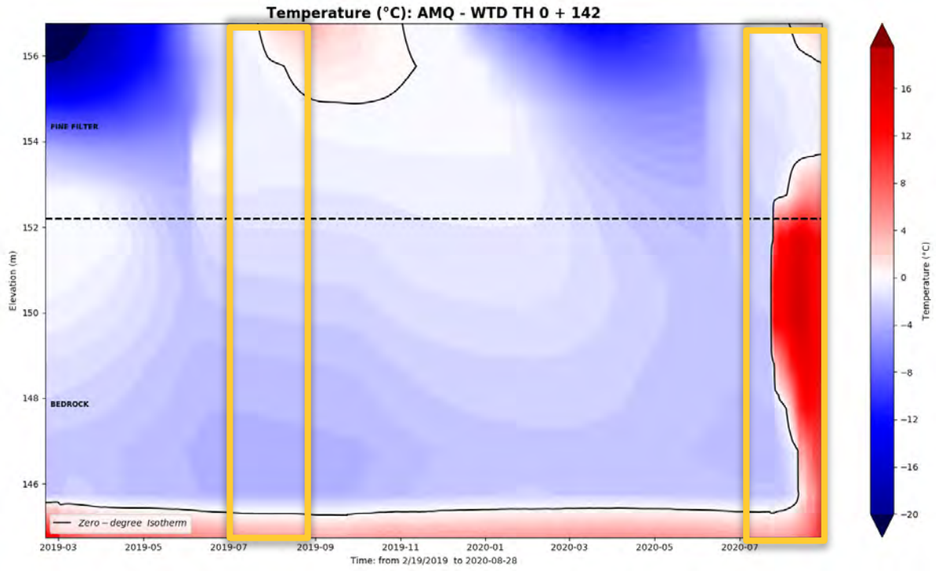
Beads 10,11,12 at el 143-145 in bedrock, consistent more important thawing on the abutment sides

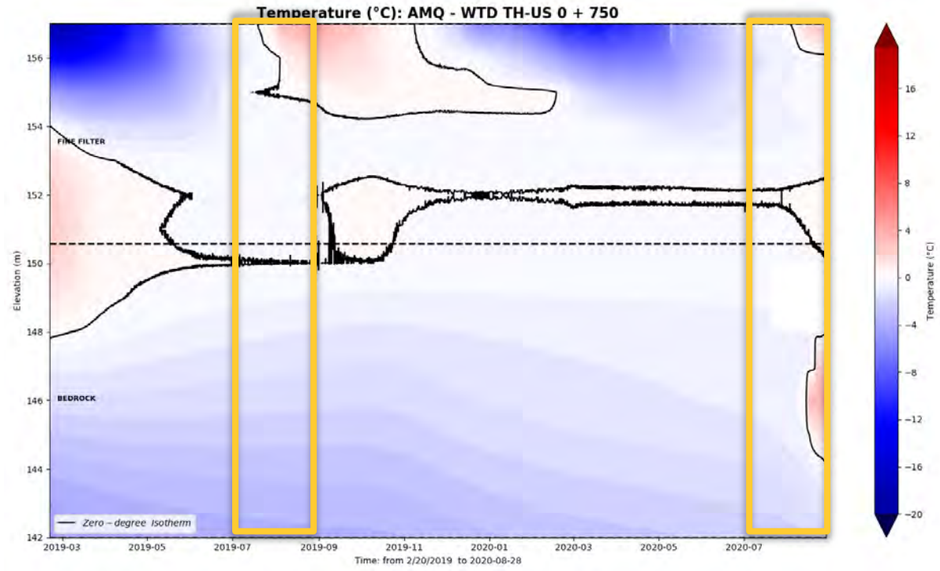
WHALE TAIL DIKE

HIGHLIGHT #5 – Increased warming of the abutment compared to last year

Additional comments:

- Profiles of TH close to the abutment show significantly higher temperature at depth than last year same period, which confirms a greater warming of the abutment.



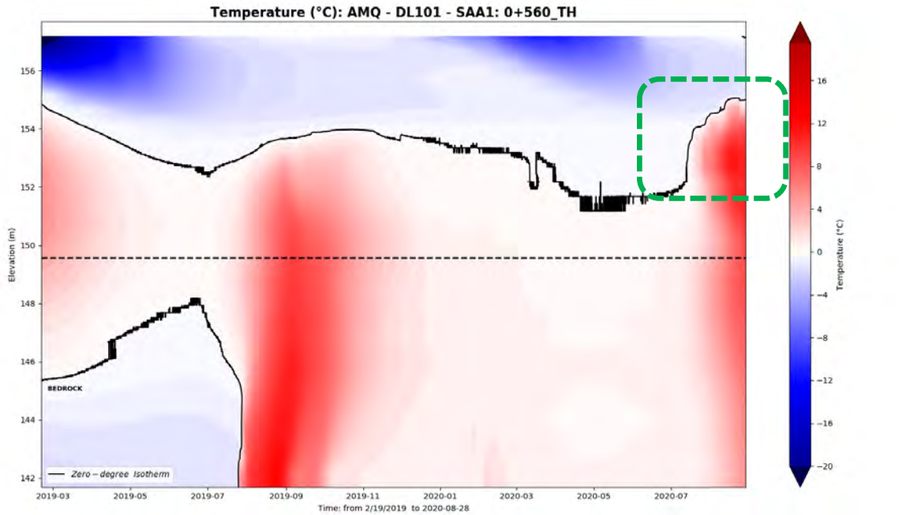


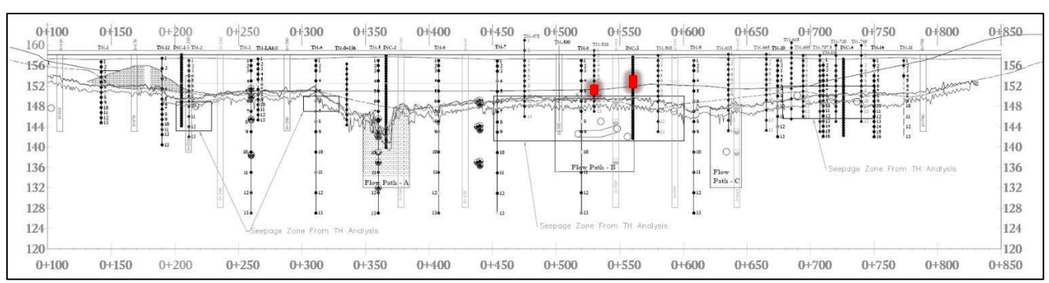
WHALE TAIL DIKE

HIGHLIGHT #6 – Water ingress signature in cutoff wall at mid-height 0+560 (update)

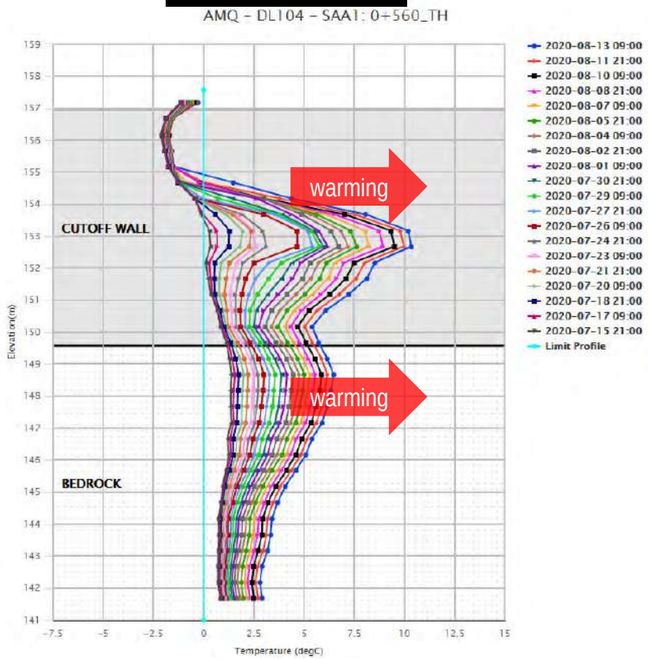
Additional comments:

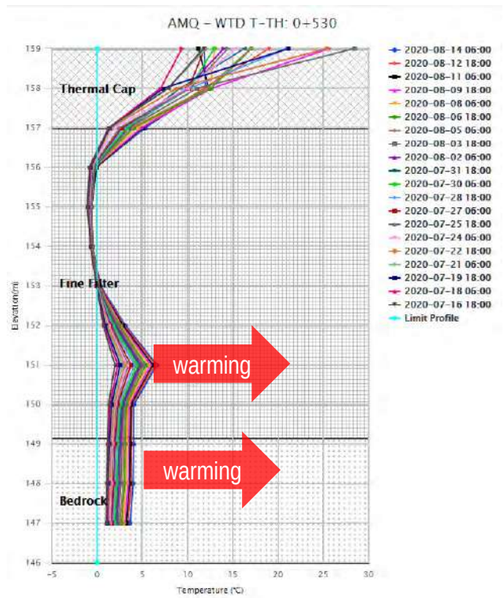
- As shown below, warming within the cutoff wall at mid-height continued in August.
- Cooling started around August 20 around el 152-153 while warming continues around that zone.
- The thermal gradient is less important with the underlying bedrock as during the previous month
- No such water ingress signature happened last year
- Similar behavior is observed in the fine filter downstream, in the same area (0+530)



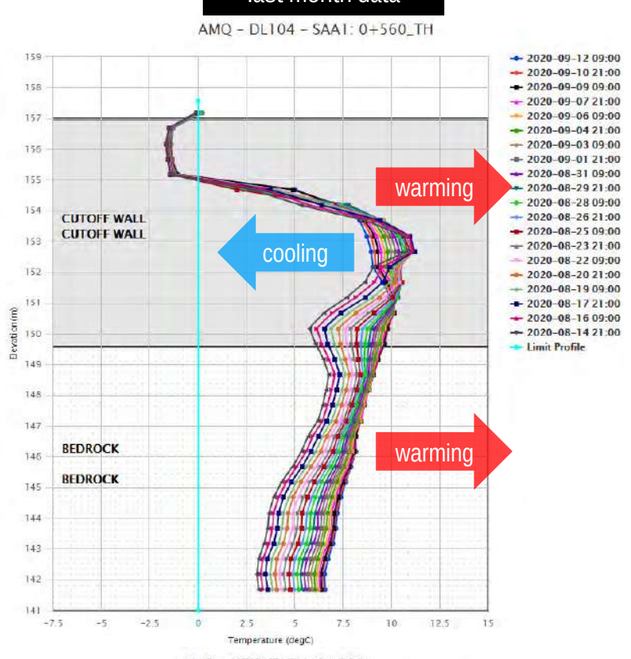


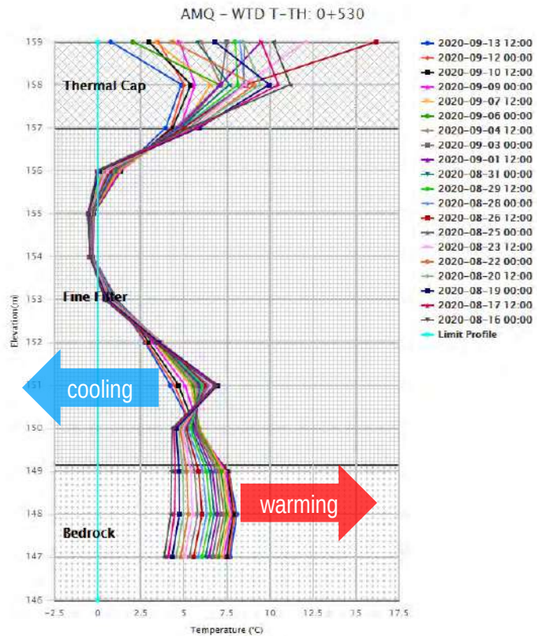
Previous month





last month data





Amaruq Dewatering Dikes Instrumentation Report

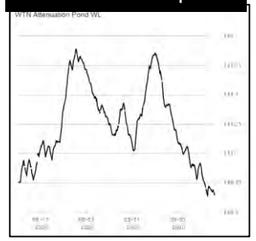
WHALE TAIL DIKE

HIGHLIGHT #6 – Most of the piezometers are hydraulically connected and react to both the water level in the lake and in the pond around P4 pumping well

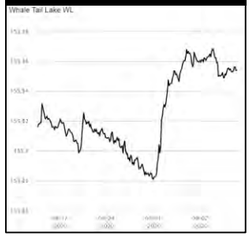
Additional comments:

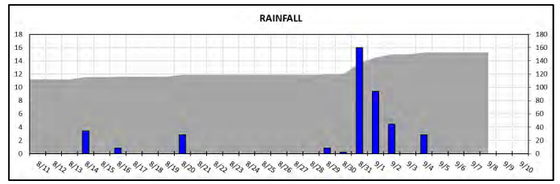
- Drop of the water level after trenches were completed at P3 & P4 pumping area, on the 2020-09-06 illustrates the connection with water level in P4 area
- Significant water level rise in the lake and most of the piezos upon rain events
- Further investigation over a larger period required to interpret the outliers (260 P3C, 360 P1C, 360 P3C, 440 P1B, 440 P2C)

WT attenuation pond

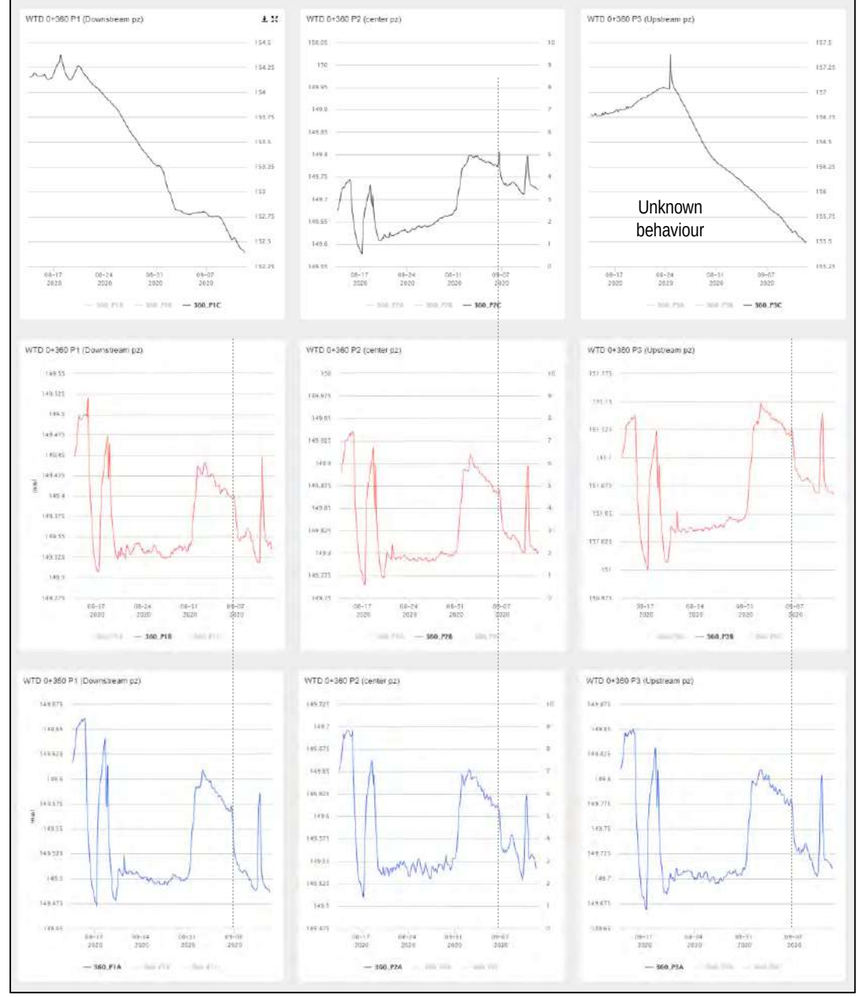


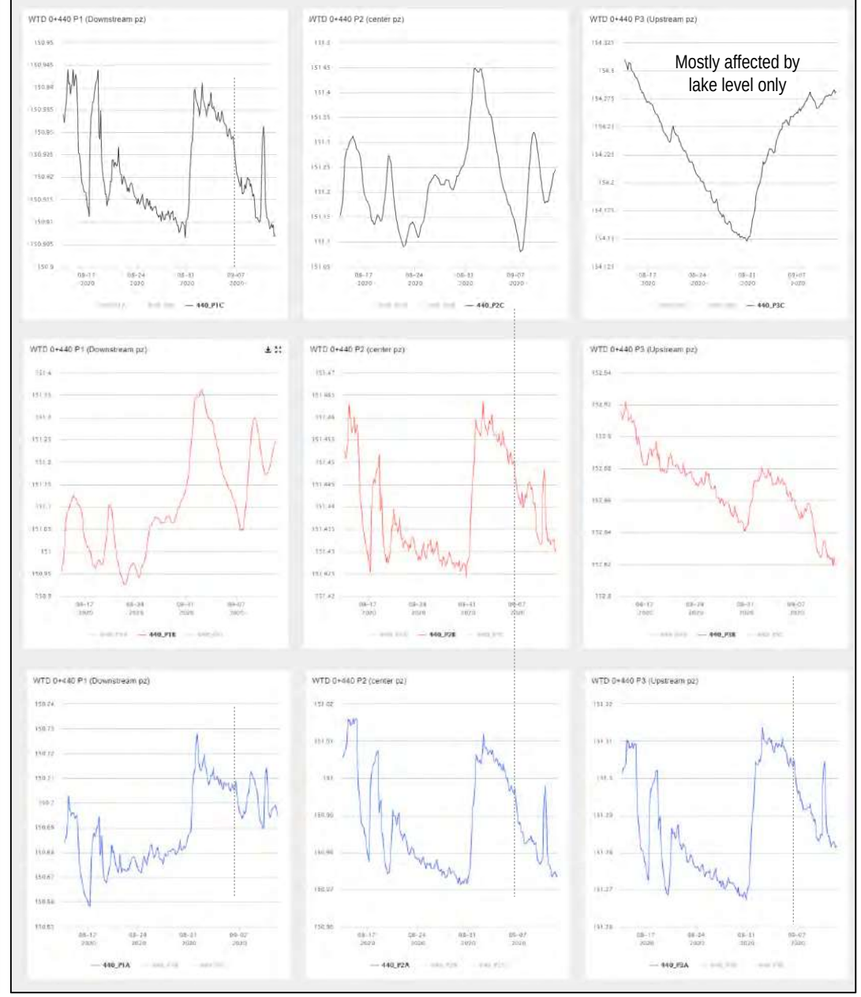
Whale Tail Lake

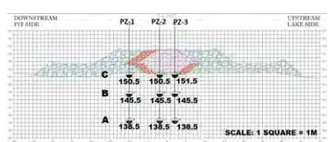


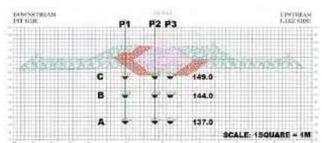


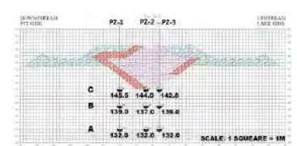






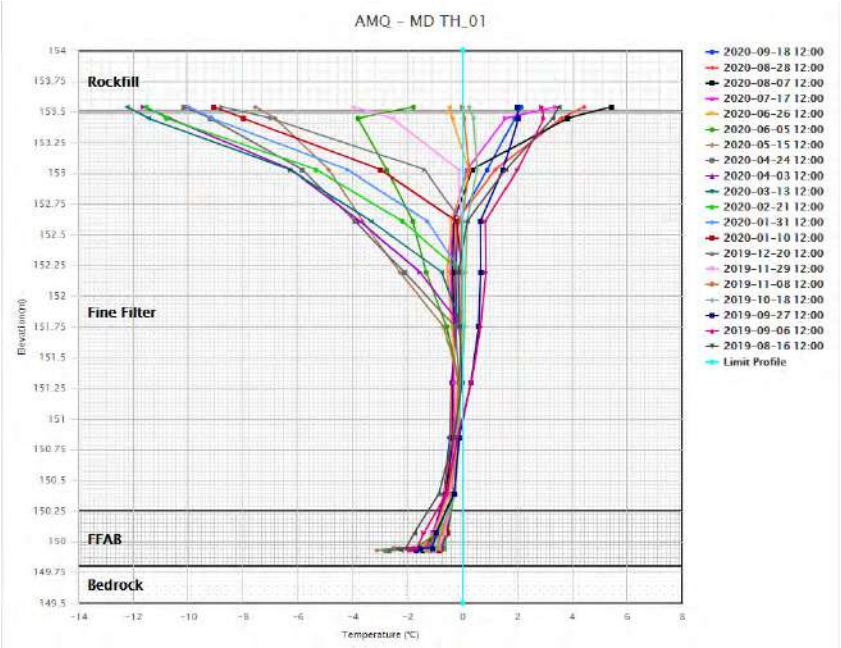


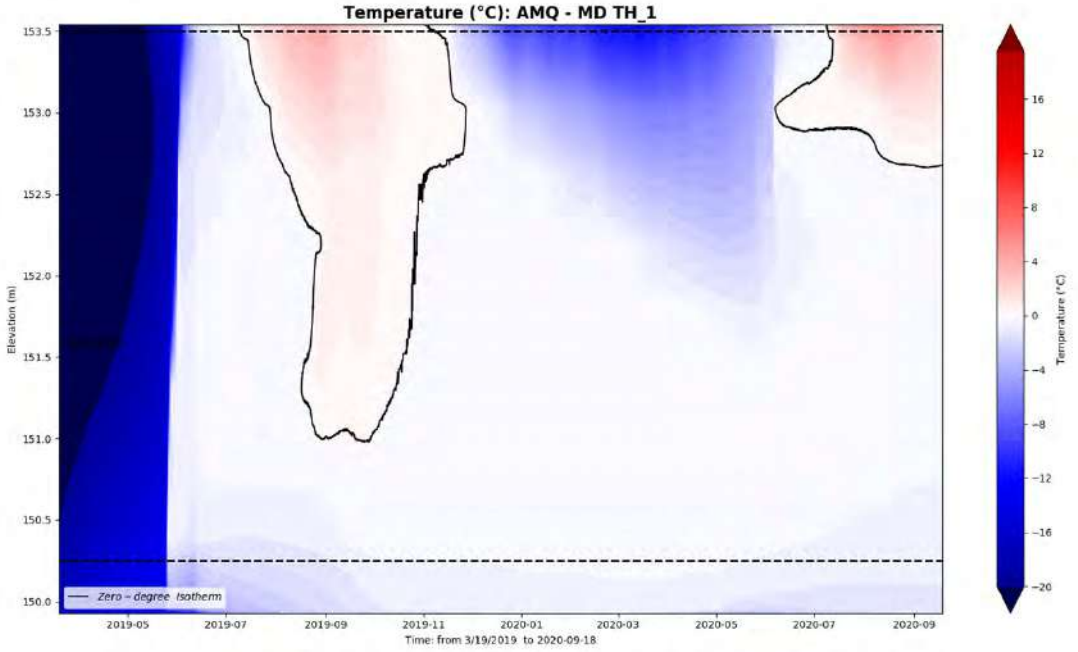


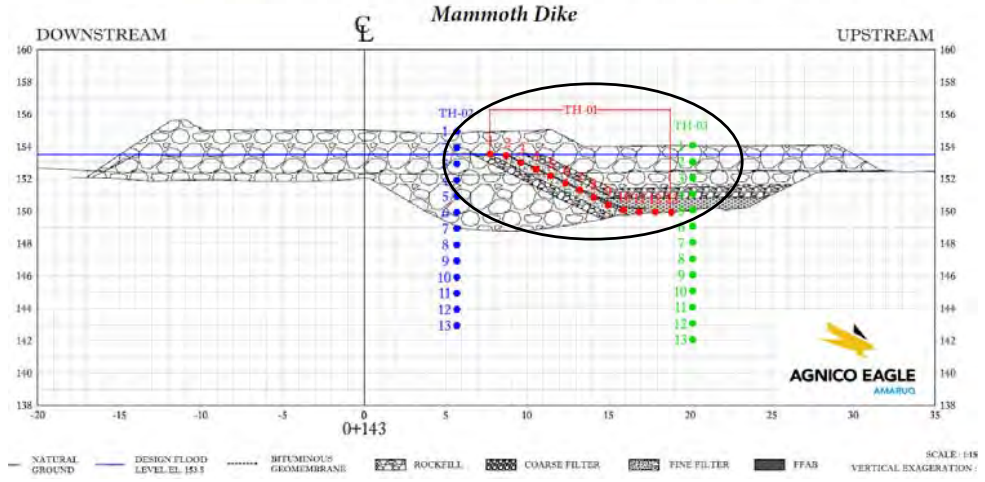


MD TH 01


MD TH
02
MAMMOTH
DIKE
MD TH
01
MD TH
03

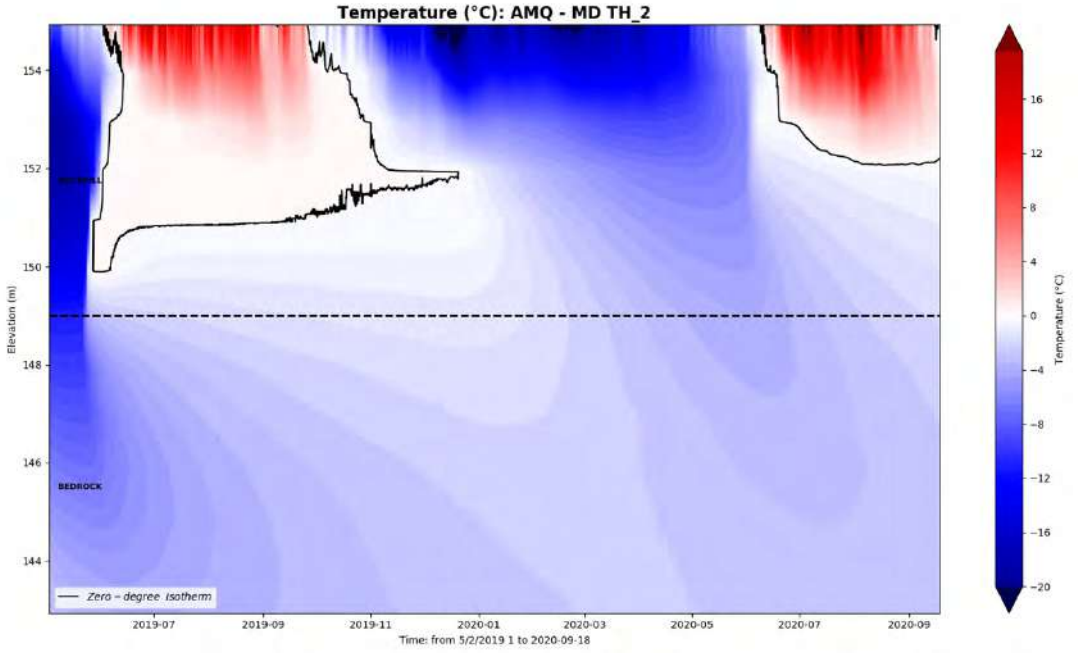

AMQ - MD TH_01
Rockfill
Fine Filter
FFAB
Bedrock
Elevation (m)
Temperature (°C)
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2020-08-28 12:00
2020-08-07 12:00
2020-07-17 12:00
2020-06-26 12:00
2020-06-05 12:00
2020-05-15 12:00
2020-04-24 12:00
2020-04-03 12:00
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2019-10-18 12:00
2019-09-27 12:00
2019-09-06 12:00
2019-08-16 12:00
Limit Profile

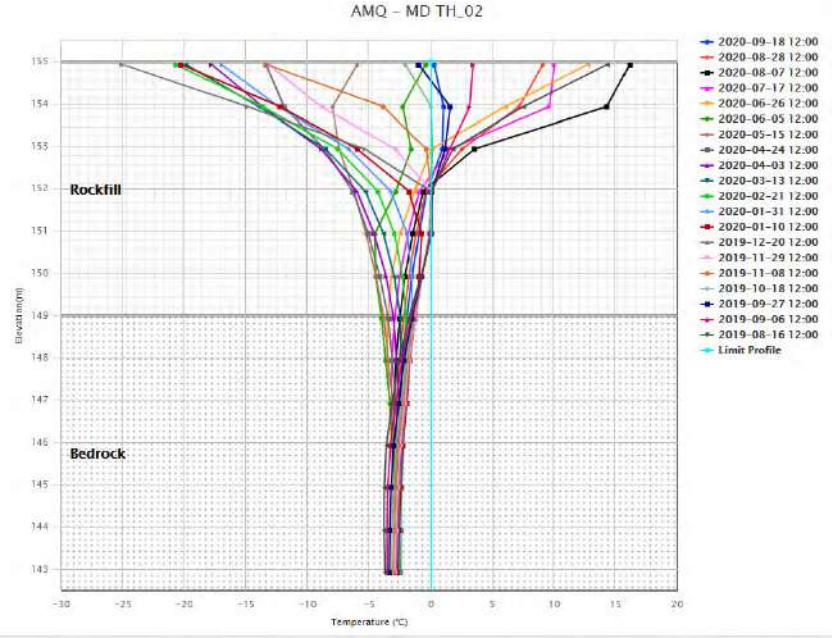

Temperature (°C): AMQ - MD TH_1
Elevation (m)
Zero - degree Isotherm
Time: from 3/19/2019 to 2020-09-18
Temperature (°C)

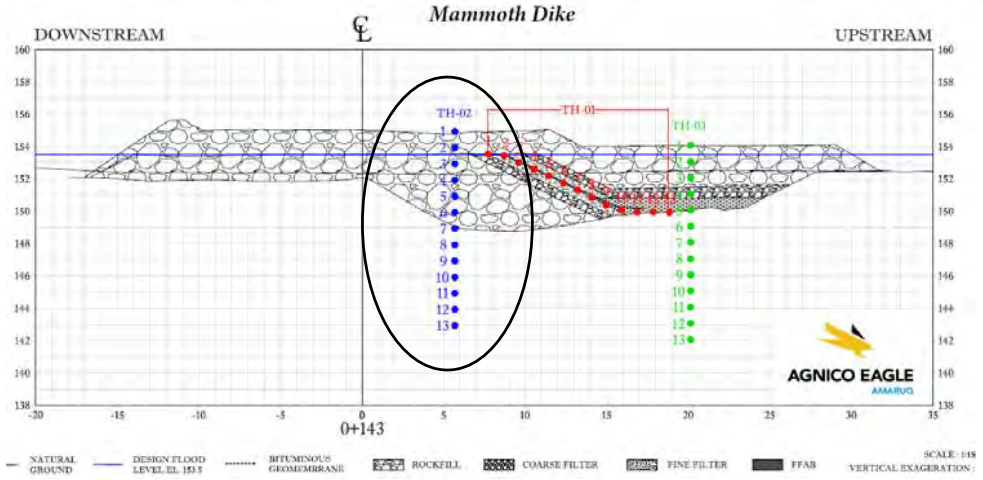

Mammoth Dike
DOWNSTREAM
UPSTREAM
TH-01
TH-02
TH-03
0+143
AGNICO EAGLE
AMARUQ
NATURAL GROUND
DESIGN FLOOD LEVEL EL. 153.5
BITUMINOUS GEOMEMBRANE
ROCKFILL
COARSE FILTER
FINE FILTER
FFAB

MD TH 02


MD TH
02
MAMMOTH
DIKE
MD TH
01
MD TH
03

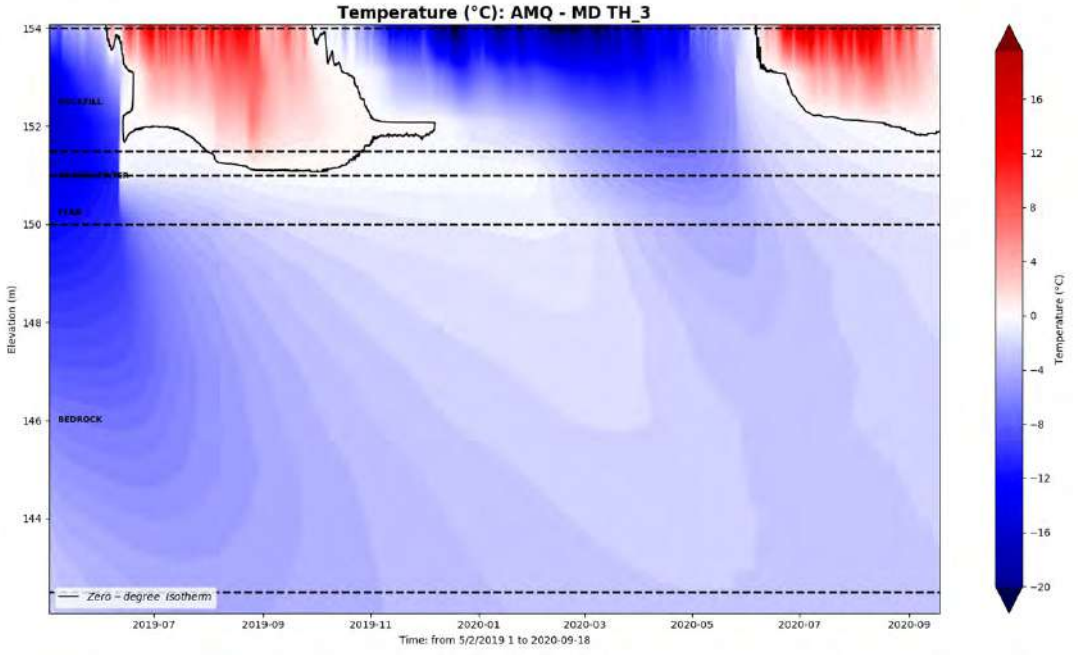

Temperature (°C): AMQ - MD TH_2
Elevation (m)
Rockfill
BEDROCK
Zero - degree isotherm
2019-07
2019-09
2019-11
2020-01
2020-03
2020-05
2020-07
2020-09
Time: from 5/2/2019 1 to 2020-09-18
Temperature (°C)

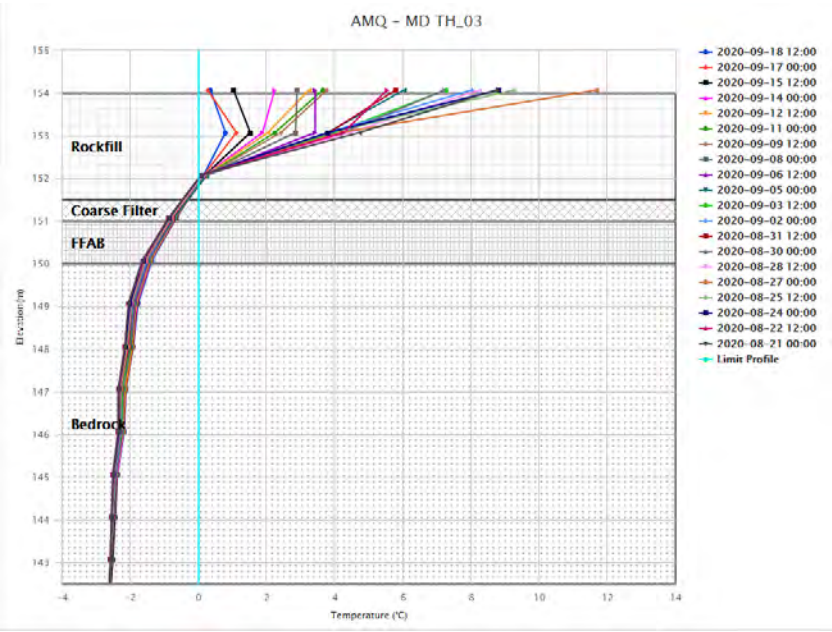

AMQ - MD TH_02
Rockfill
Bedrock
Elevation (m)
Temperature (°C)
2020-09-18 12:00
2020-08-28 12:00
2020-08-07 12:00
2020-07-17 12:00
2020-06-26 12:00
2020-06-05 12:00
2020-05-15 12:00
2020-04-24 12:00
2020-04-03 12:00
2020-03-13 12:00
2020-02-21 12:00
2020-01-31 12:00
2020-01-10 12:00
2019-12-20 12:00
2019-11-29 12:00
2019-11-08 12:00
2019-10-18 12:00
2019-09-27 12:00
2019-09-06 12:00
2019-08-16 12:00
Limit Profile

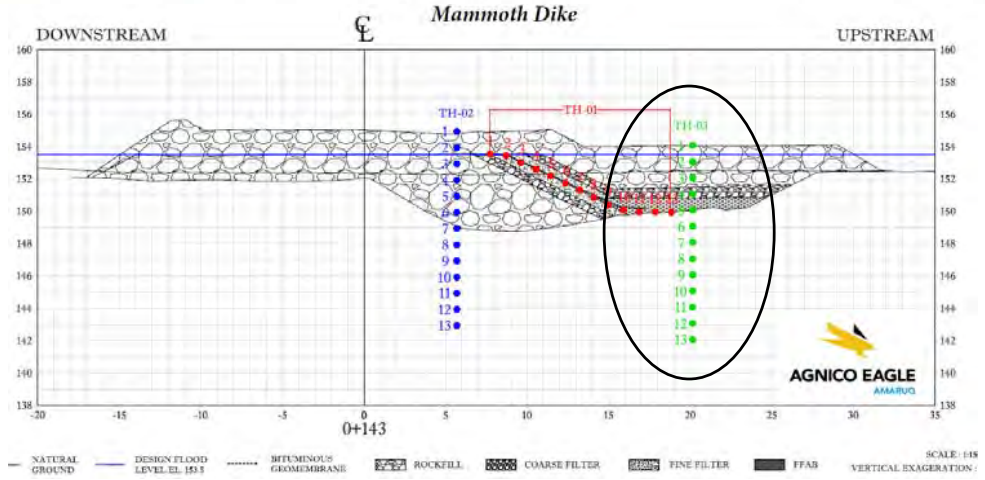

Mammoth Dike
DOWNSTREAM
UPSTREAM
TH-02
TH-01
TH-03
0+143
AGNICO EAGLE
AMARUQ
NATURAL GROUND
DESIGN FLOOD LEVEL EL. 153.5
BITUMINOUS GEOMEMBRANE
ROCKFILL
COARSE FILTER
FINE FILTER
FFAB

MD TH 03


MD TH
02
MAMMOTH
DIKE
MD TH
01
MD TH
03

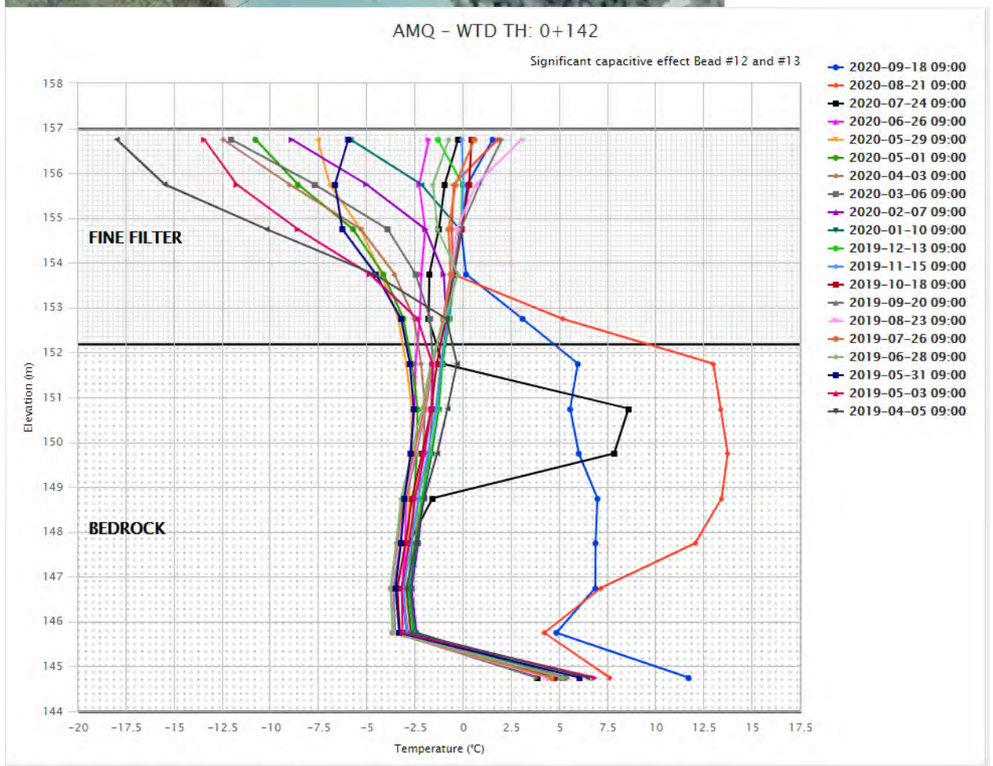

Temperature (°C): AMQ - MD TH_3
Elevation (m)
Time: from 5/2/2019 1 to 2020-09-18
Zero - degree isotherm
BEDROCK
Temperature (°C)

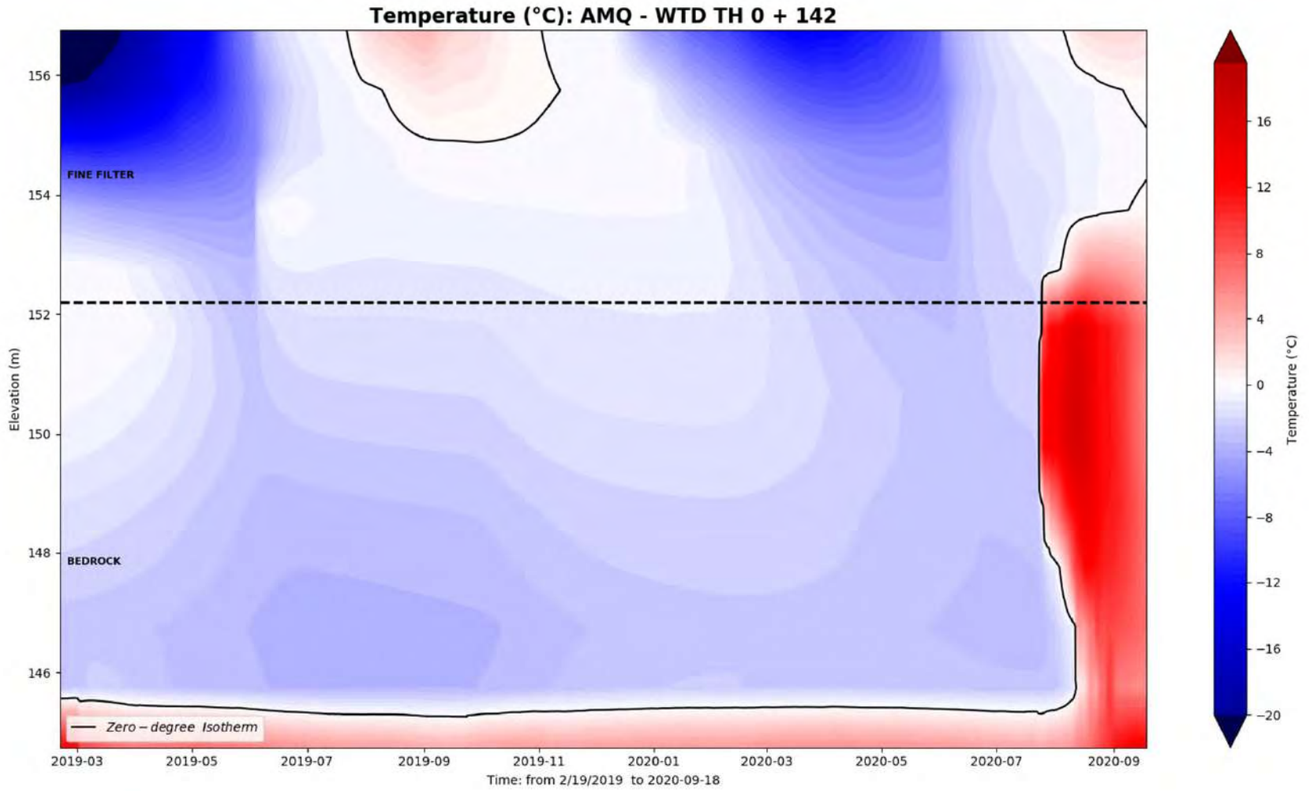

AMQ - MD TH_03
Rockfill
Coarse Filter
FFAB
Bedrock
Temperature (°C)
Limit Profile

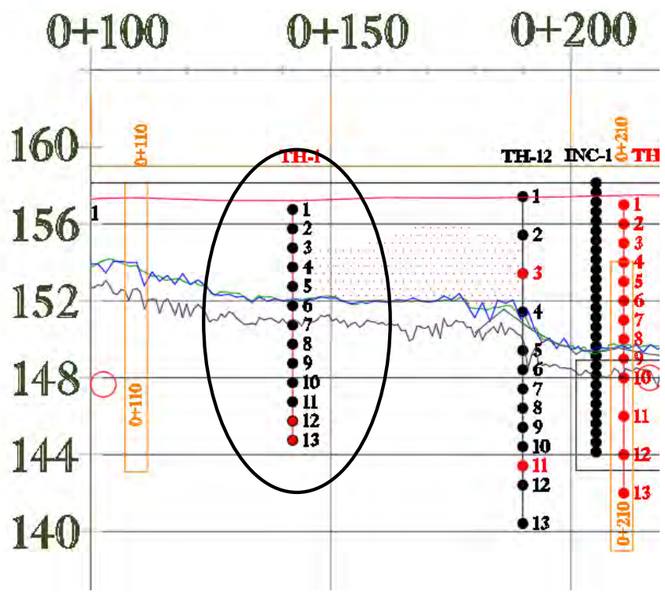

Mammoth Dike
DOWNSTREAM
UPSTREAM
TH-02
TH-01
TH-03
0+143
AGNICO EAGLE
NATURAL GROUND
DESIGN FLOOD LEVEL EL. 153.5
BITUMINOUS GEOMEMBRANE
ROCKFILL
COARSE FILTER
FINE FILTER
FFAB

WTD-TH 0+142



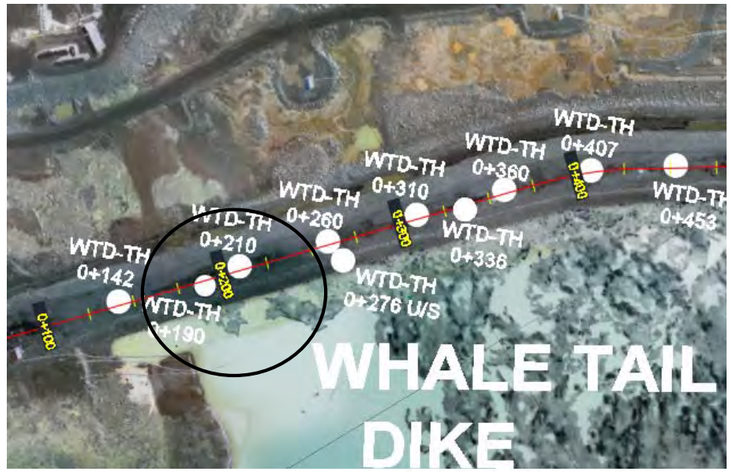


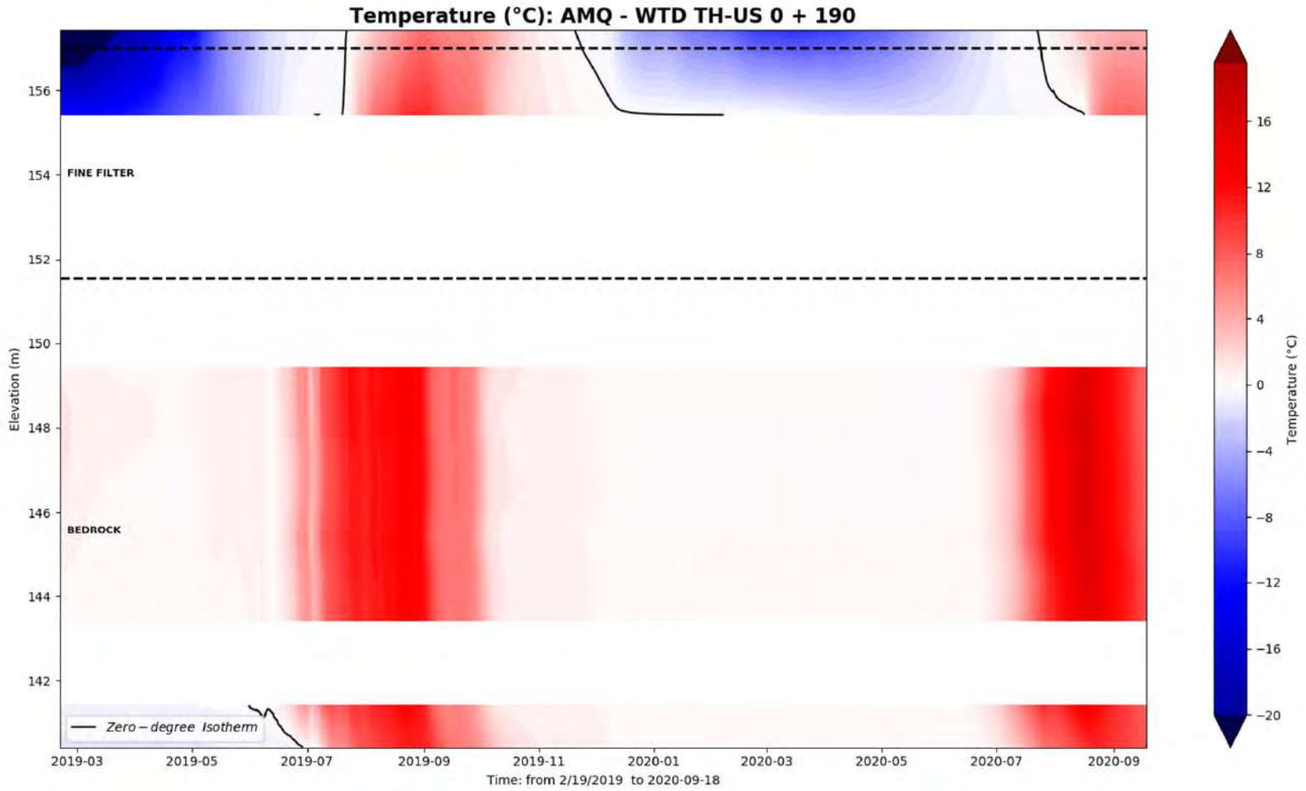


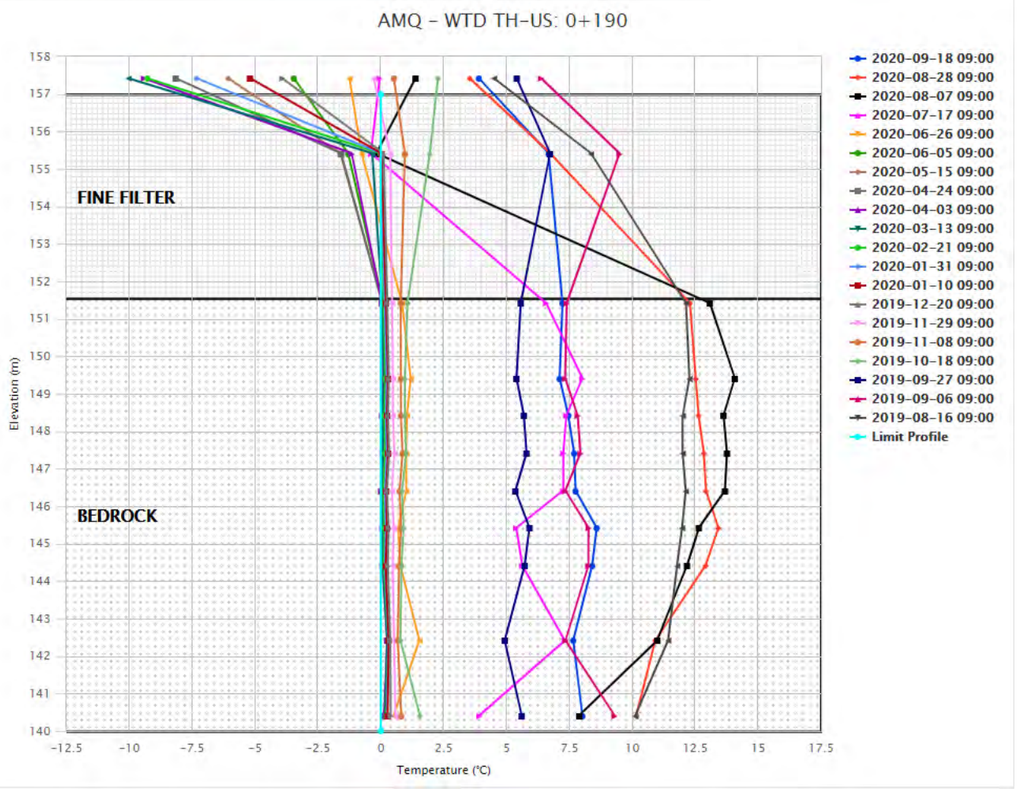


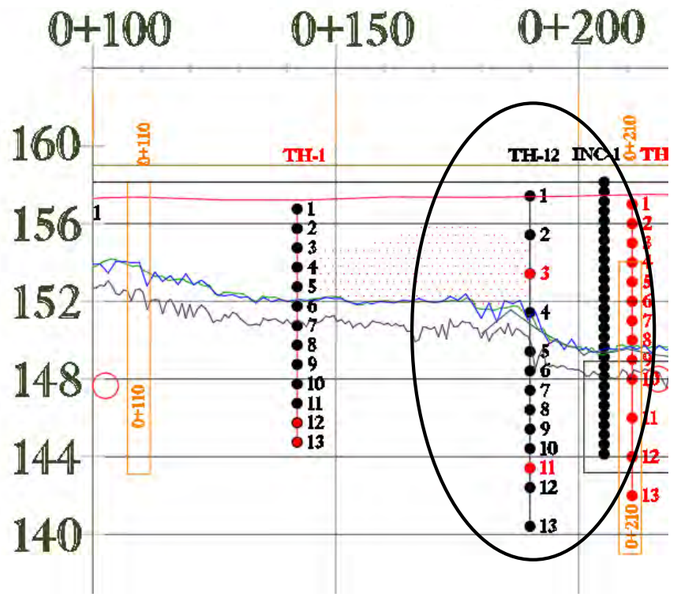
LEGEND :
- APPROVED BEDROCK
- GROUTING EXTENT
- TOP DIKE EL. 157m
- BOTTOM SECANTS PILES
- ENCOUNTERED BEDROCK BY HENRY DRILLING
- BEDROCK ENCOUNTERED DURING INJECTION CASING INSTALLATION (0.700M UPSTREAM OFFSET CENTERLINE)

WTD-TH 0+190 U/S







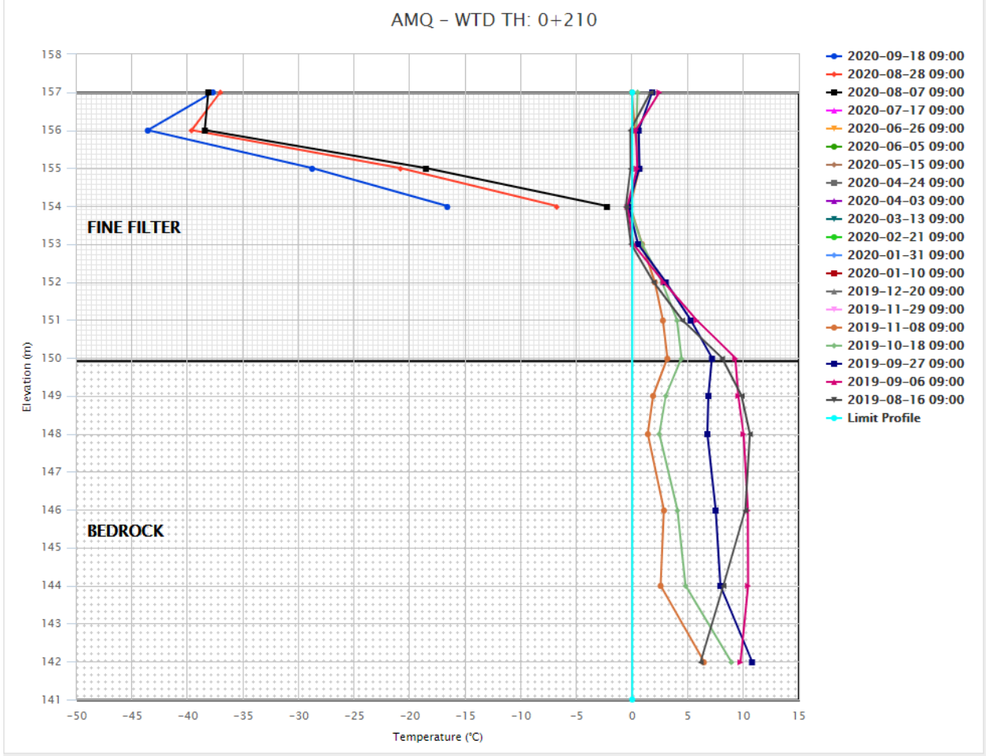


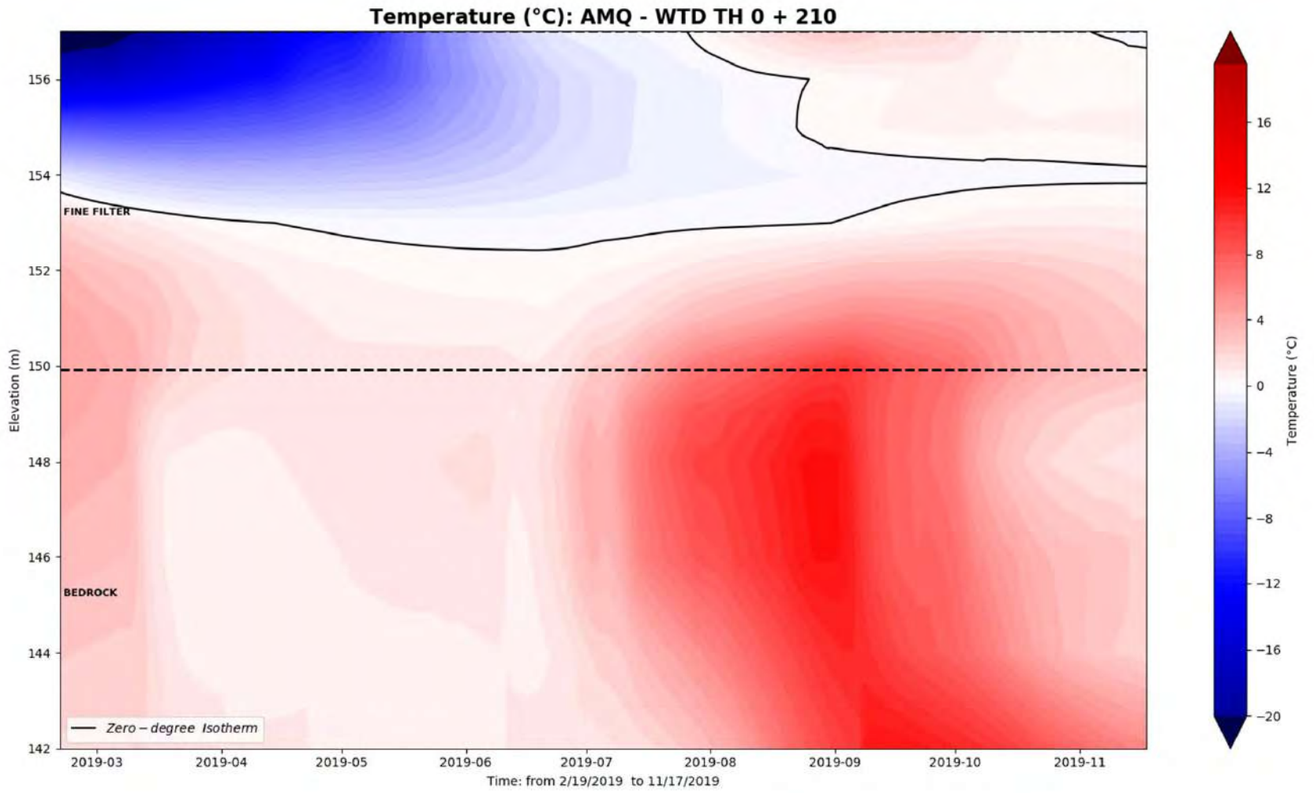
LEGEND :

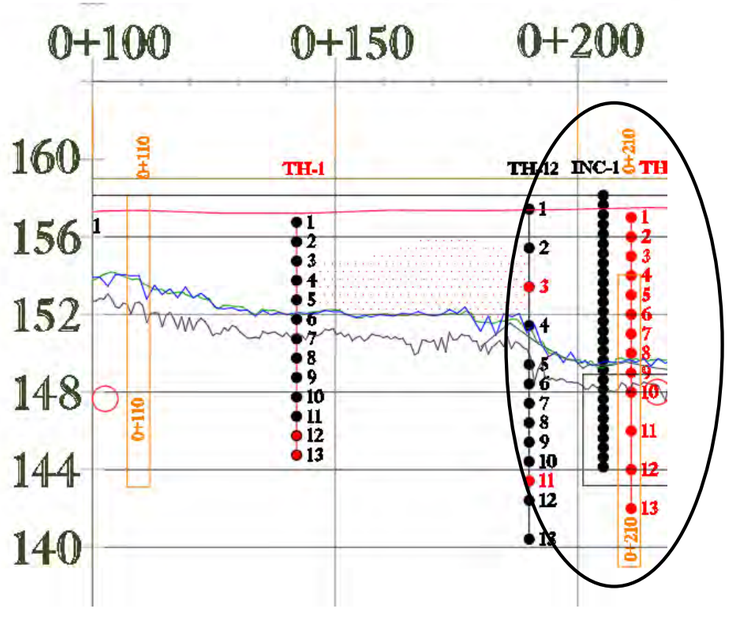
- APPROVED BEDROCK
- GROUTING EXTENT
- TOP DIKE EL. 157m
- BOTTOM SECANTS PILES
- ENCOUNTERED BEDROCK BY HENRY DRILLING
- BEDROCK ENCOUNTERED DURING INJECTION CASING INSTALLATION (0.700M UPSTREAM OFFSET CENTERLINE)

WTD-TH 0+210





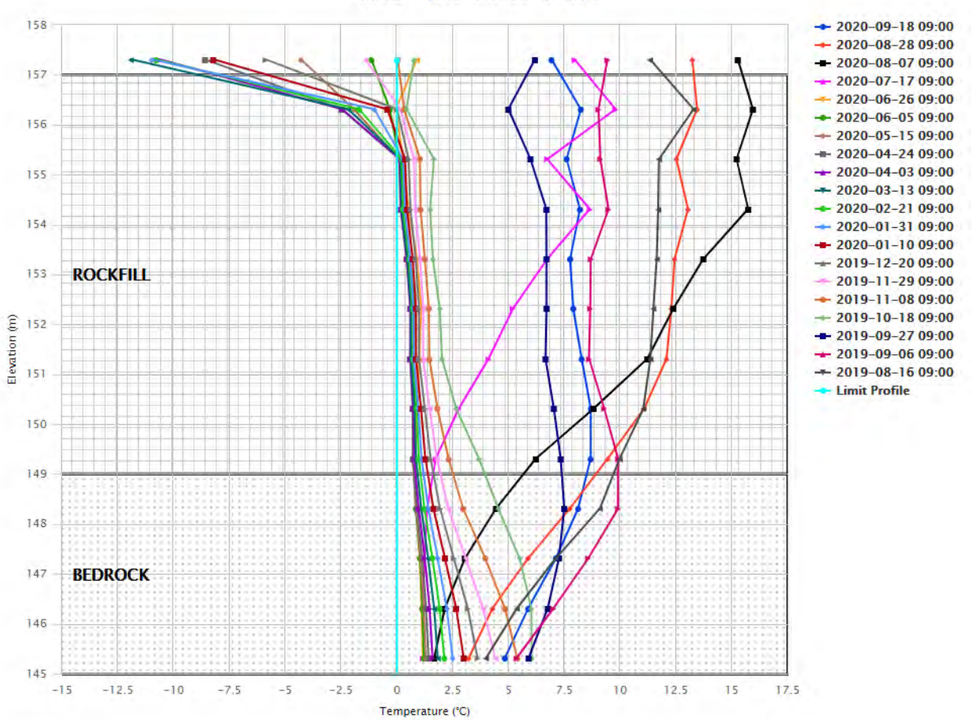


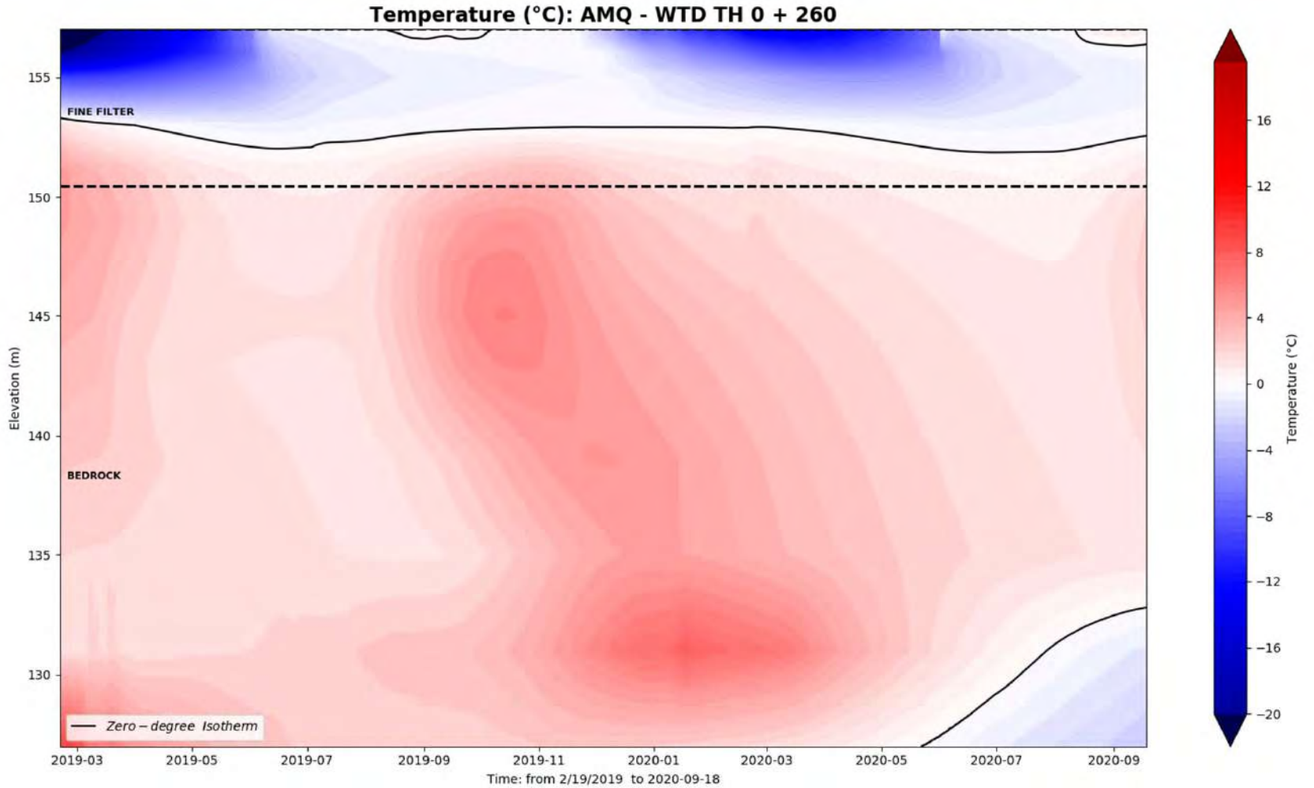


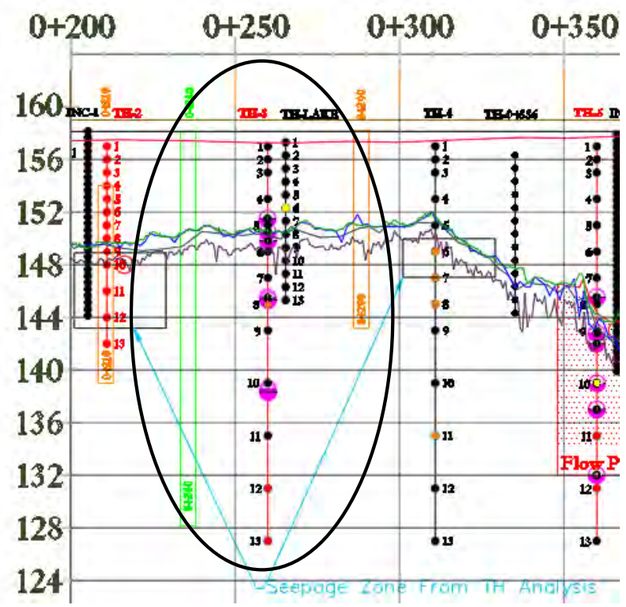
LEGEND :
- APPROVED BEDROCK
- GROUTING EXTENT
- TOP DIKE EL. 157m
- BOTTOM SECANTS PILES
- ENCOUNTERED BEDROCK BY HENRY DRILLING
- BEDROCK ENCOUNTERED DURING INJECTION CASING INSTALLATION (0.700M UPSTREAM OFFSET CENTERLINE)

WTD-TH 0+260 U/S





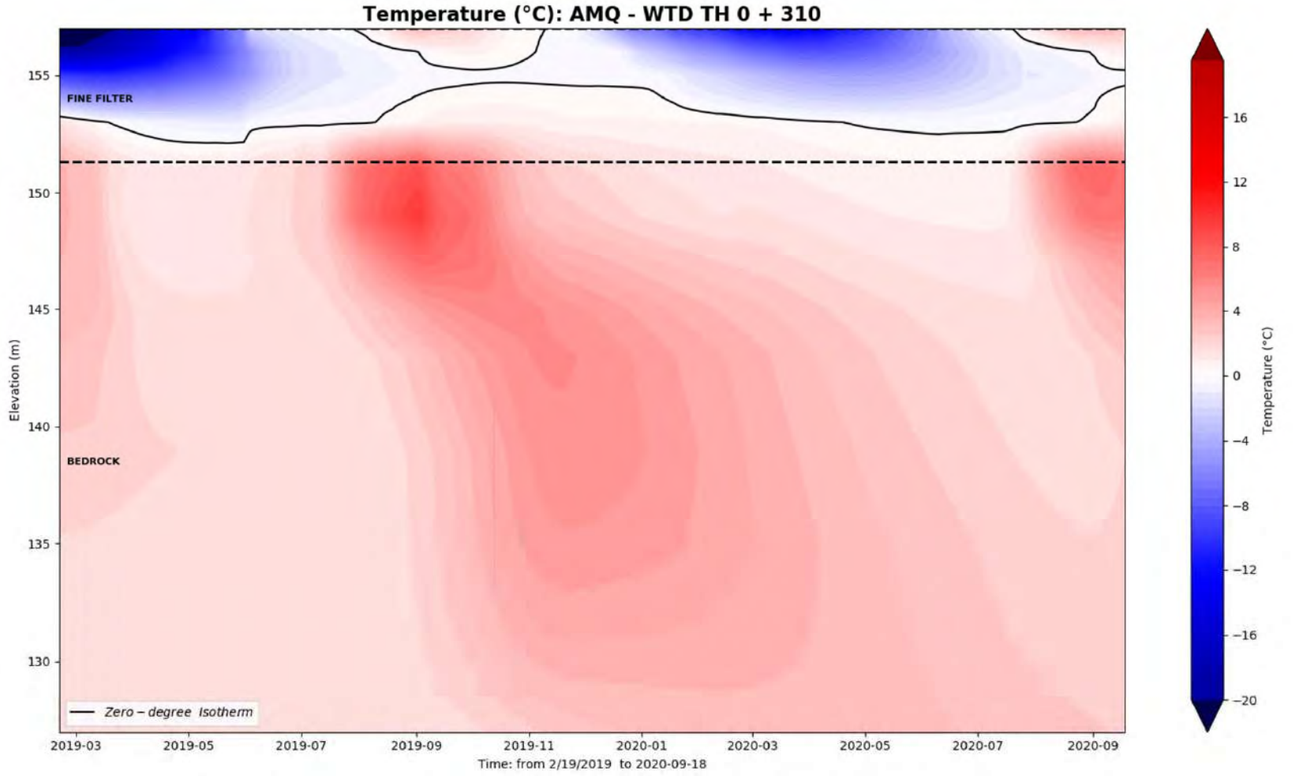


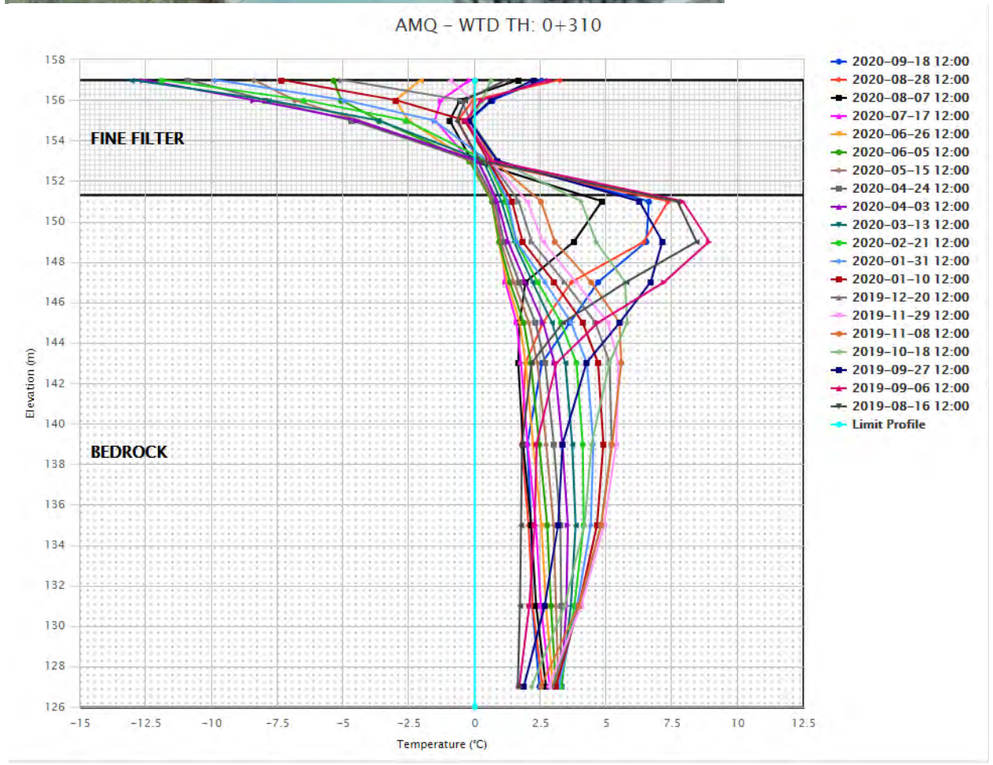


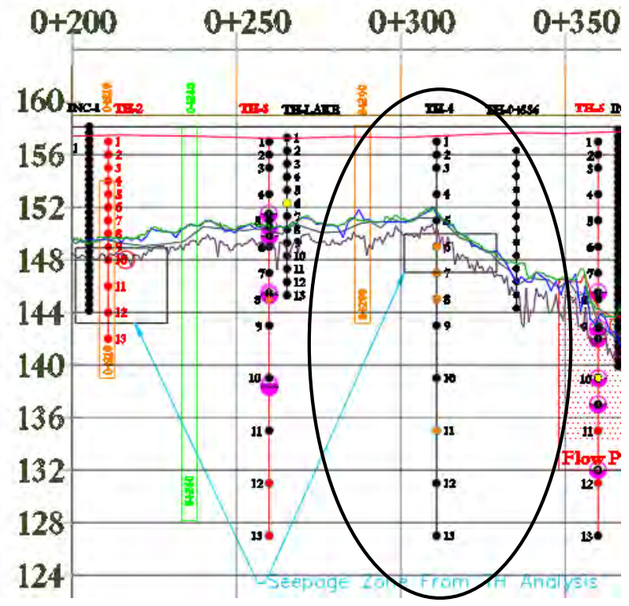
LEGEND :
- APPROVED BEDROCK
- TOP DIKE EL. 157m
- BOTTOM SECANTS PILES
- ENCOUNTERED BEDROCK BY HENRY DRILLING
- BEDROCK ENCOUNTERED DURING INJECTION CASING INSTALLATION (0.700M UPSTREAM OFFSET CENTERLINE)
- GROUTING EXTENT

WTD-TH 0+310







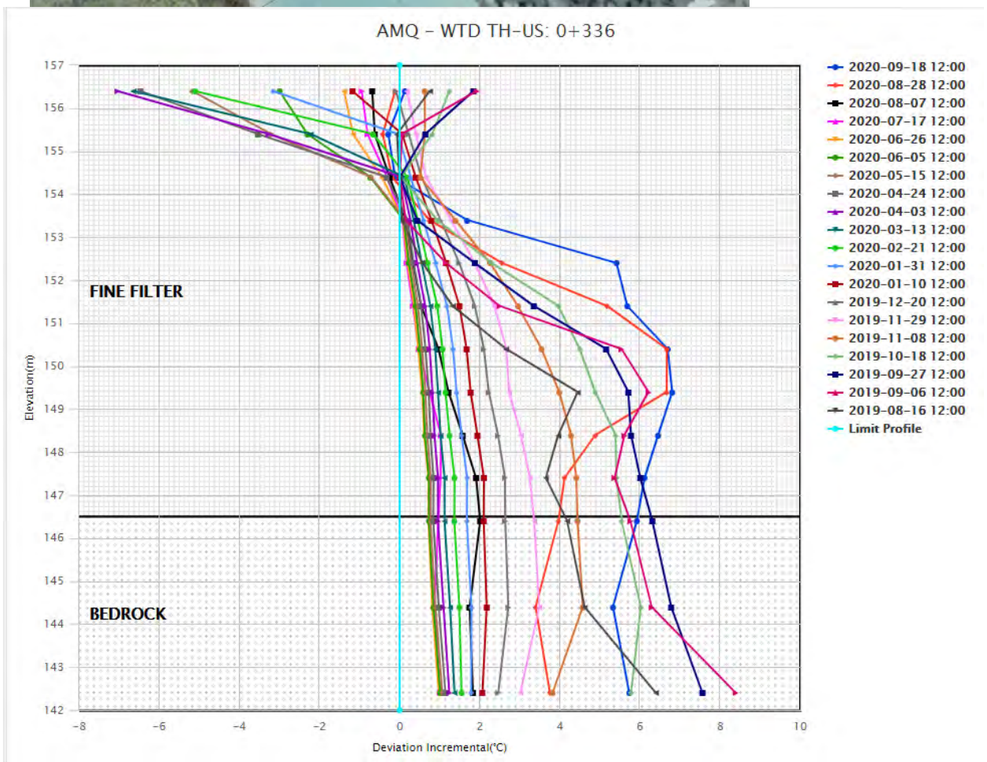


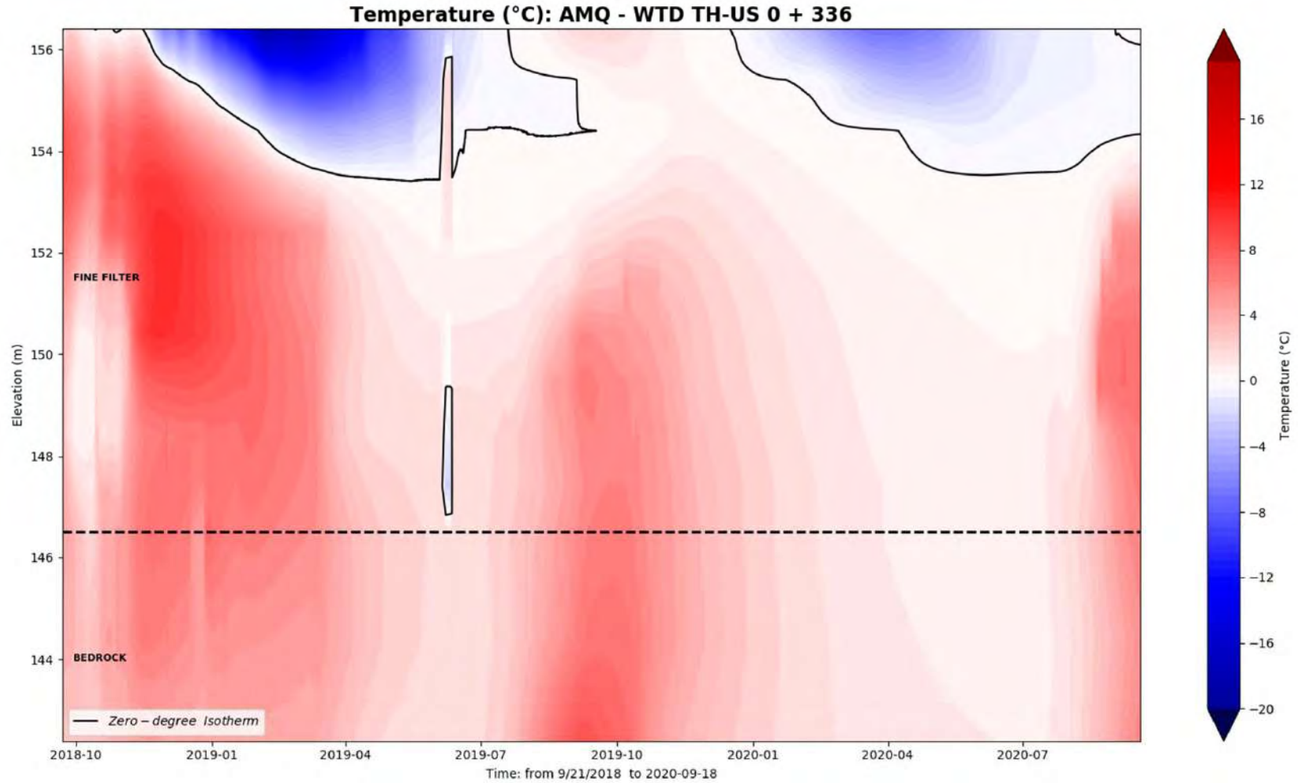
LEGEND :

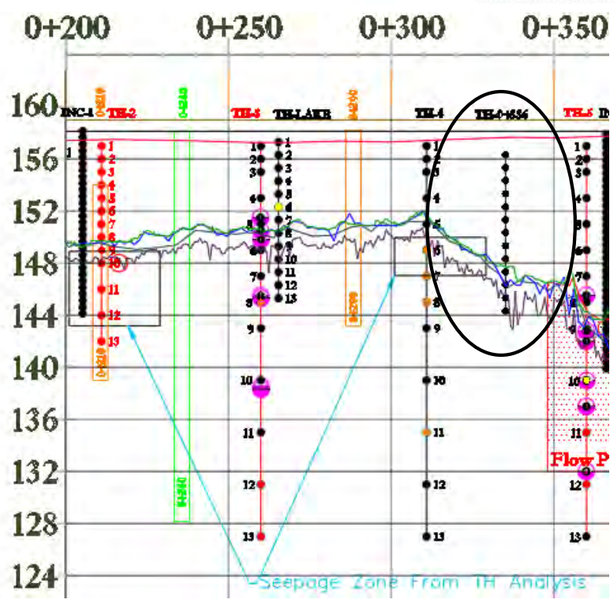
- APPROVED BEDROCK
- TOP DIKE EL. 157m
- BOTTOM SECANTS PILES
- ENCOUNTERED BEDROCK BY HENRY DRILLING
- BEDROCK ENCOUNTERED DURING INJECTION CASING INSTALLATION (0.700M UPSTREAM OFFSET CENTERLINE)
- GROUTING EXTENT

WTD-TH 0+336 U/S







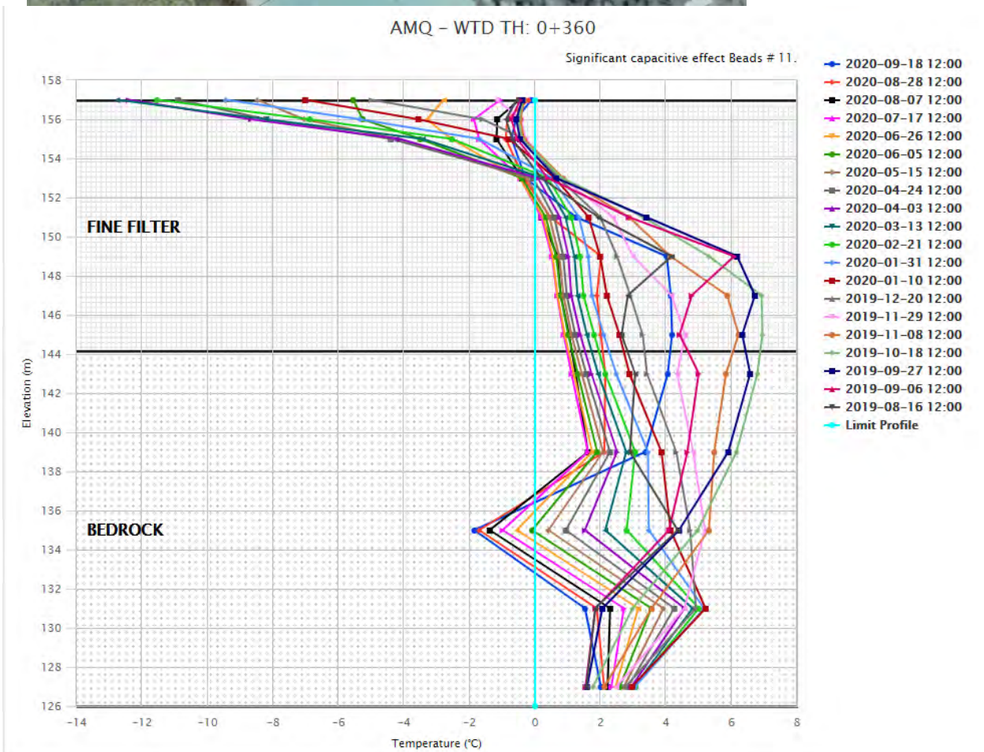


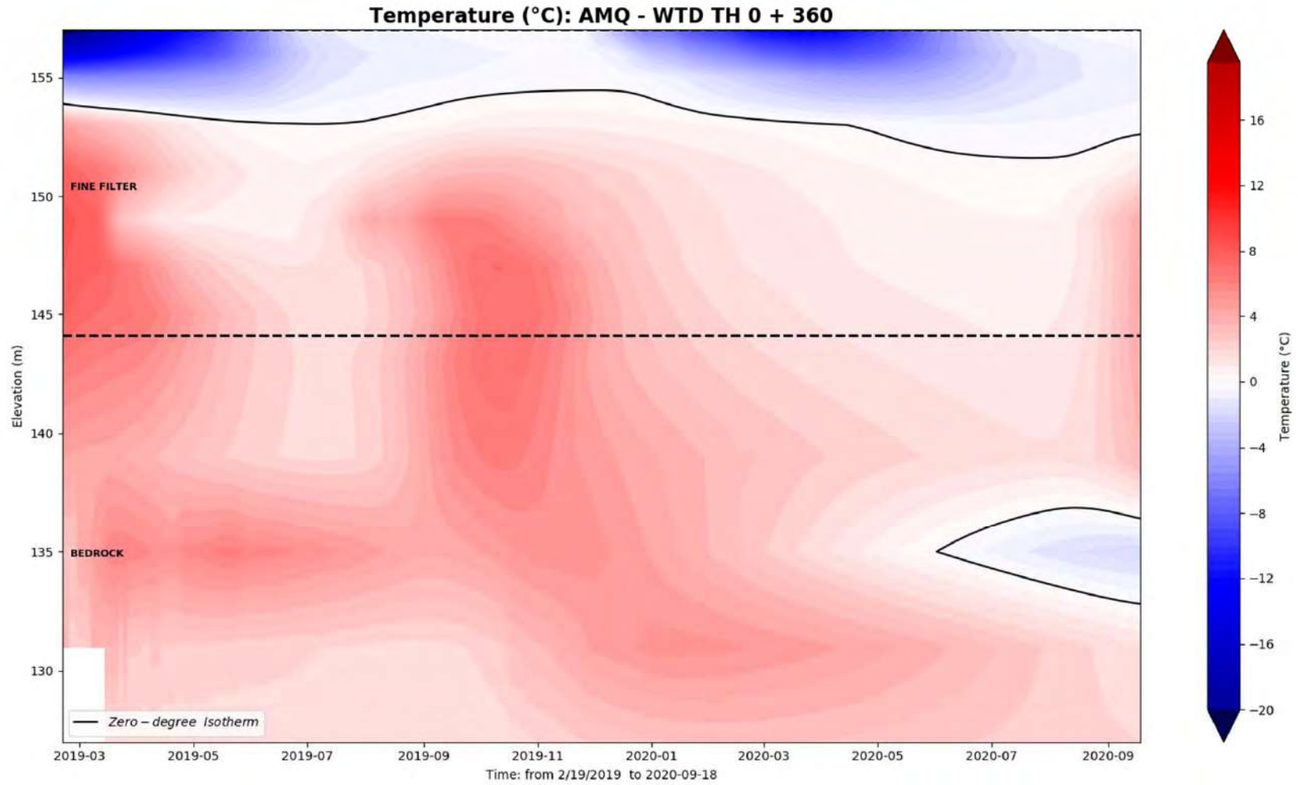
LEGEND :

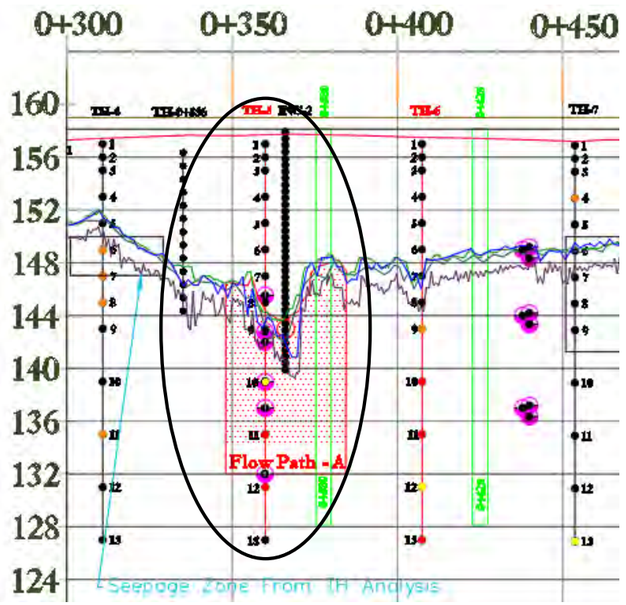
- APPROVED BEDROCK
- TOP DIKE EL. 157m
- BOTTOM SECANTS PILES
- ENCOUNTERED BEDROCK BY HENRY DRILLING
- BEDROCK ENCOUNTERED DURING INJECTION CASING INSTALLATION (0.700M UPSTREAM OFFSET CENTERLINE)
- GROUTING EXTENT

WTD-TH 0+360





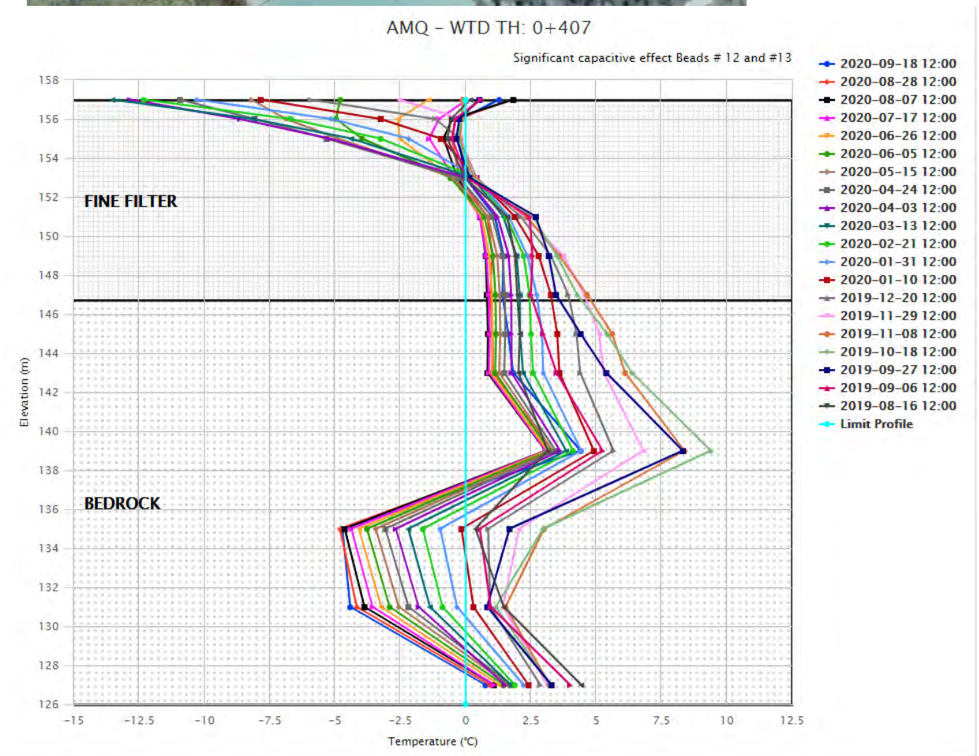


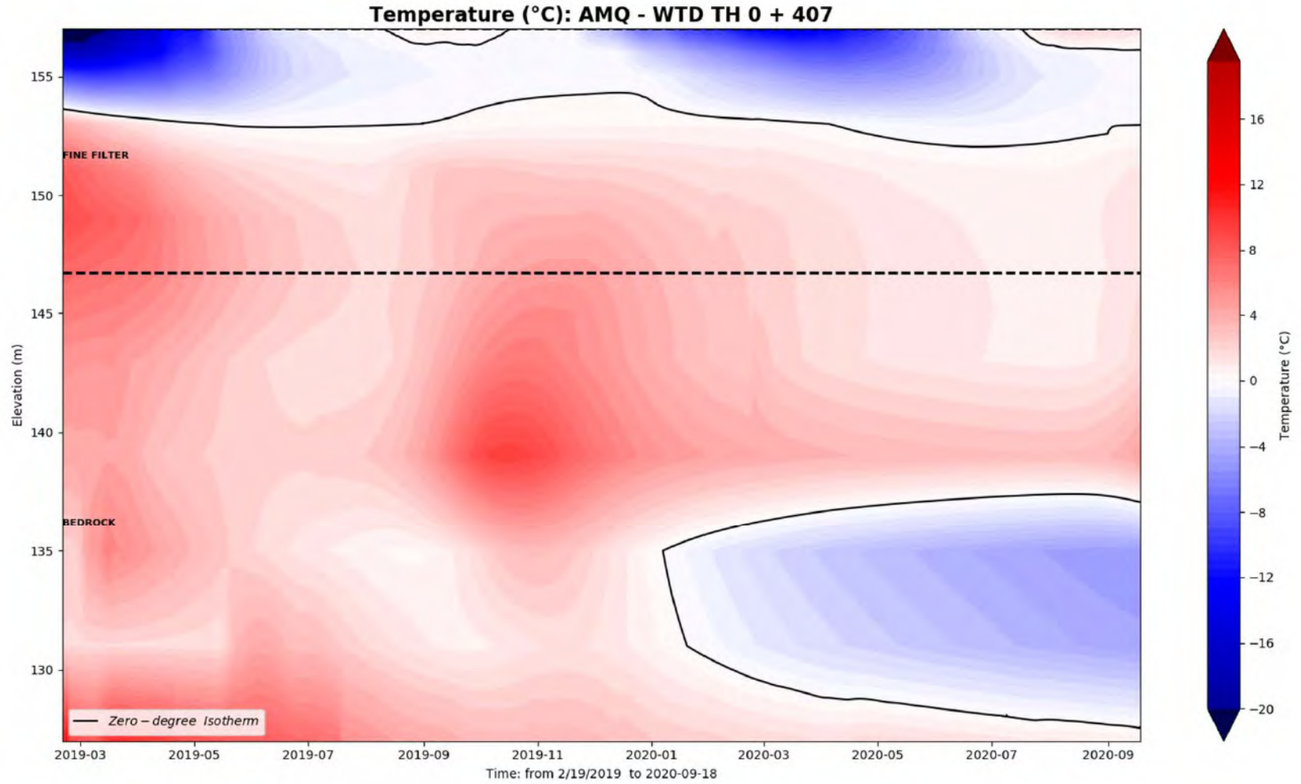


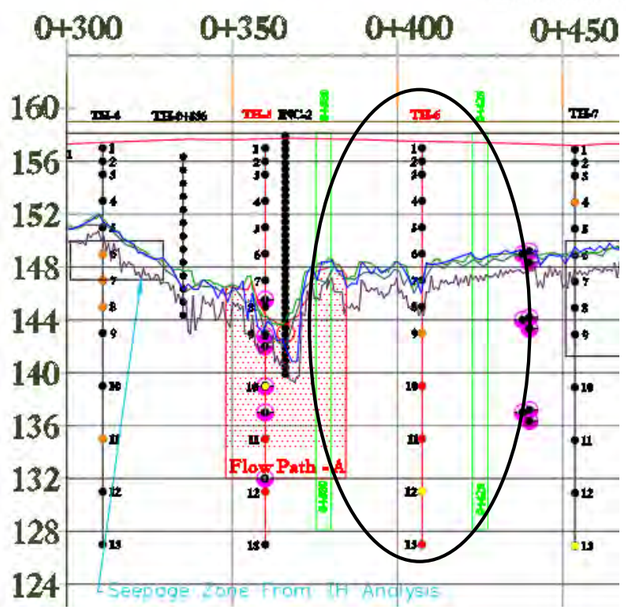
LEGEND :
- APPROVED BEDROCK
- TOP DIKE EL. 157m
- BOTTOM SECANTS PILES
- ENCOUNTERED BEDROCK BY HENRY DRILLING
- BEDROCK ENCOUNTERED DURING INJECTION CASING INSTALLATION (0.700M UPSTREAM OFFSET CENTERLINE)
- GROUTING EXTENT

WTD-TH 0+407





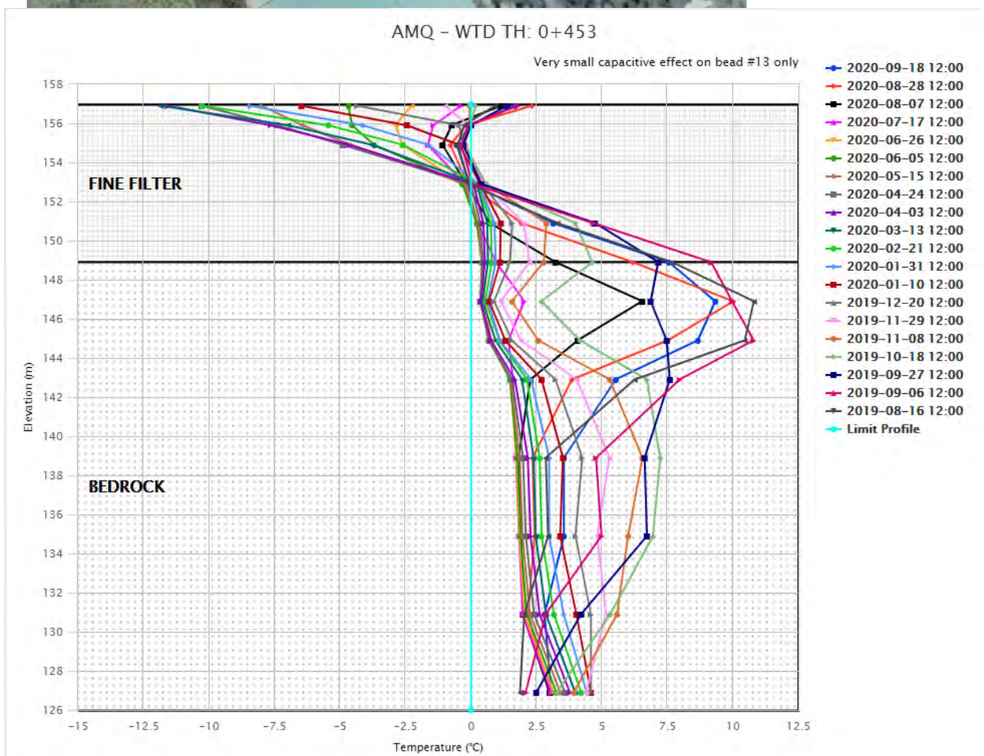


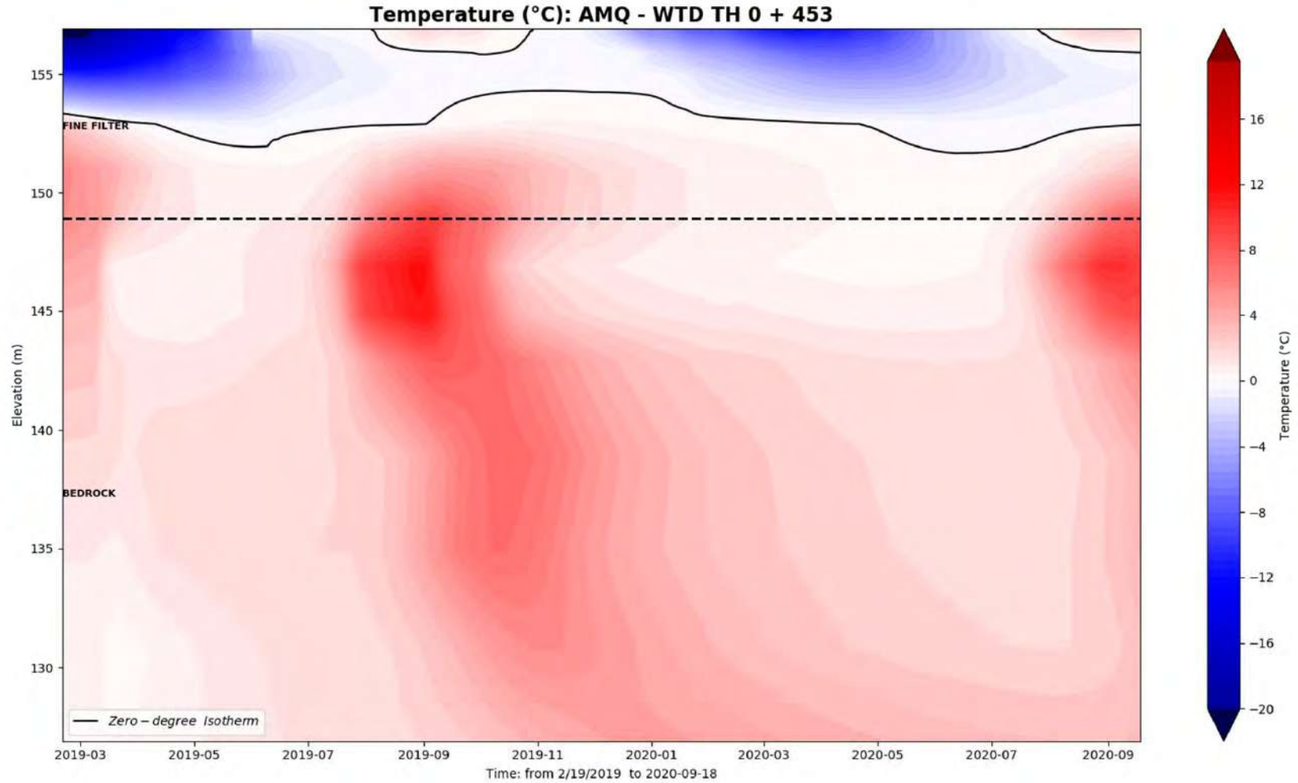


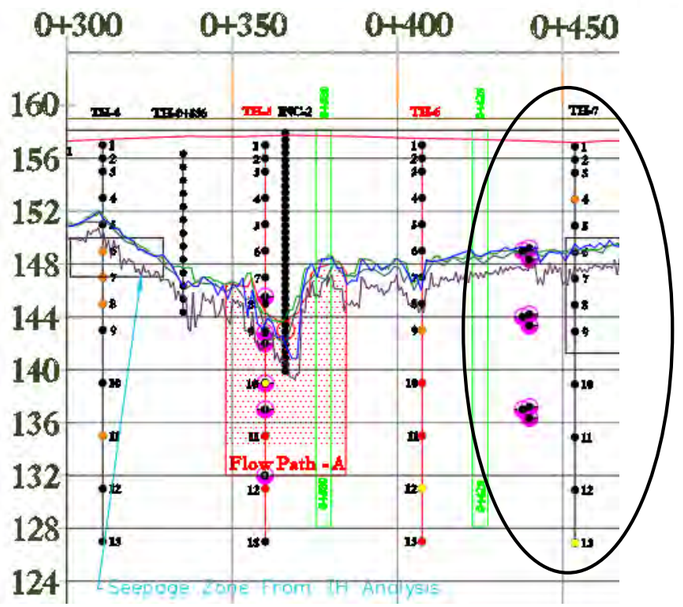
LEGEND :
- APPROVED BEDROCK
- TOP DIKE EL. 157m
- BOTTOM SECANTS PILES
- ENCOUNTERED BEDROCK BY HENRY DRILLING
- BEDROCK ENCOUNTERED DURING INJECTION CASING INSTALLATION (0.700M UPSTREAM OFFSET CENTERLINE)
- GROUTING EXTENT

WTD-TH 0+453



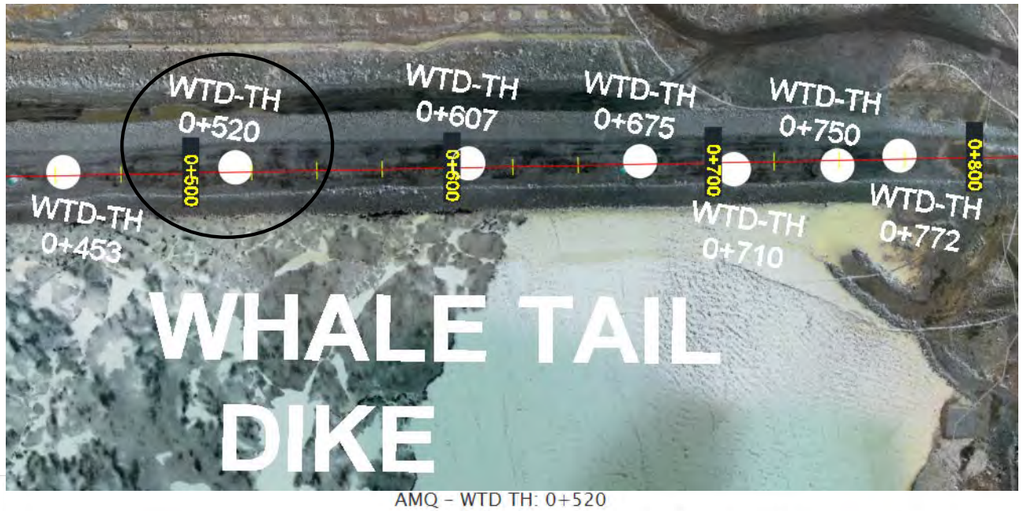


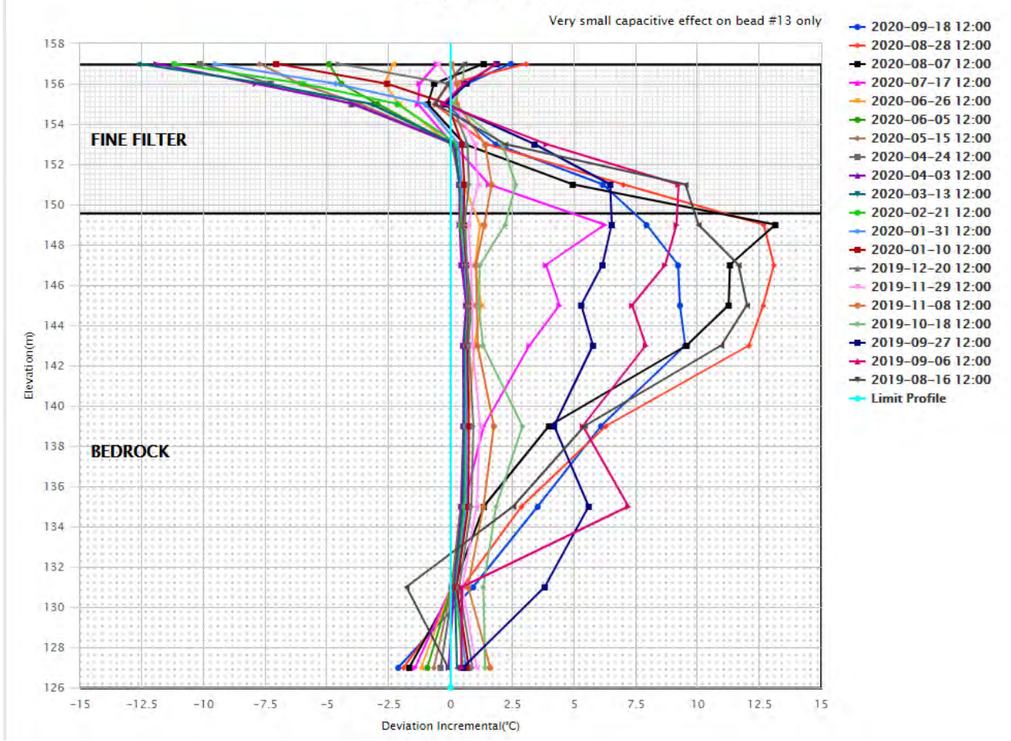


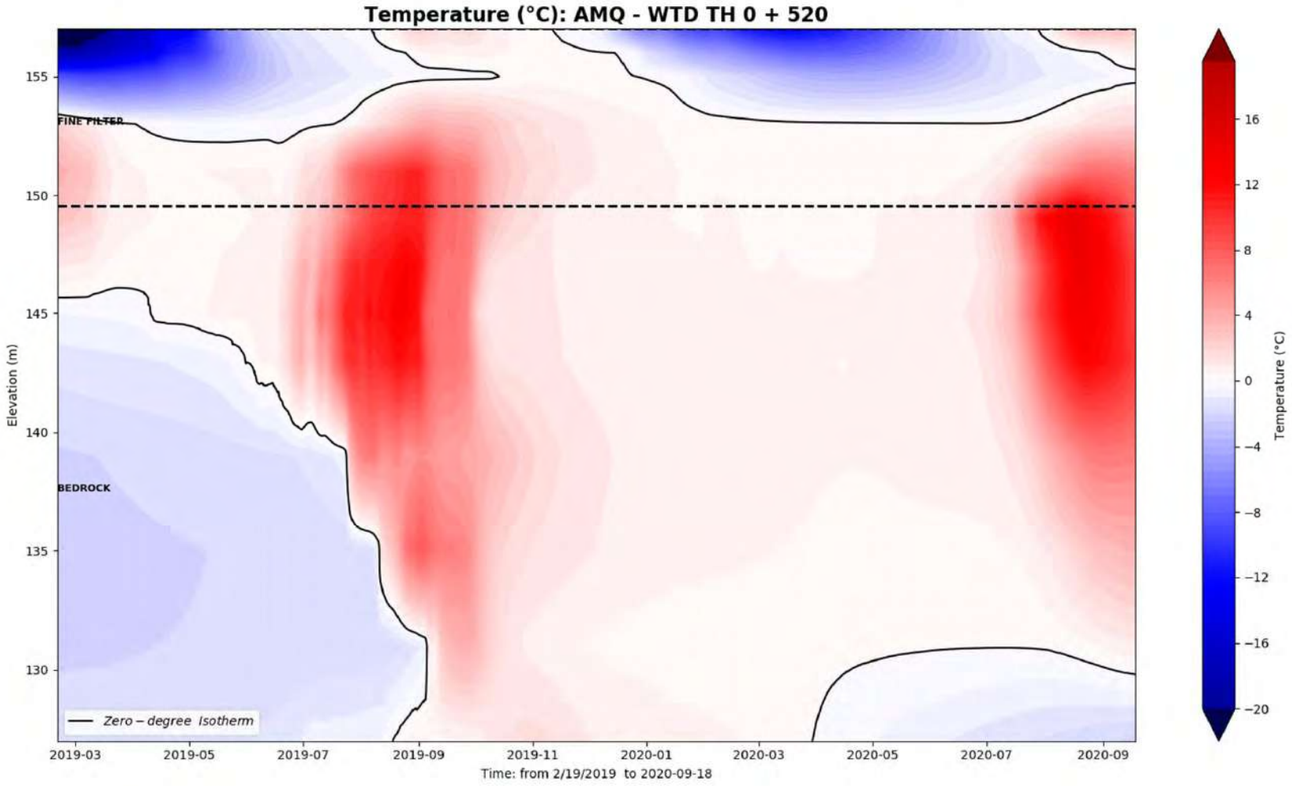


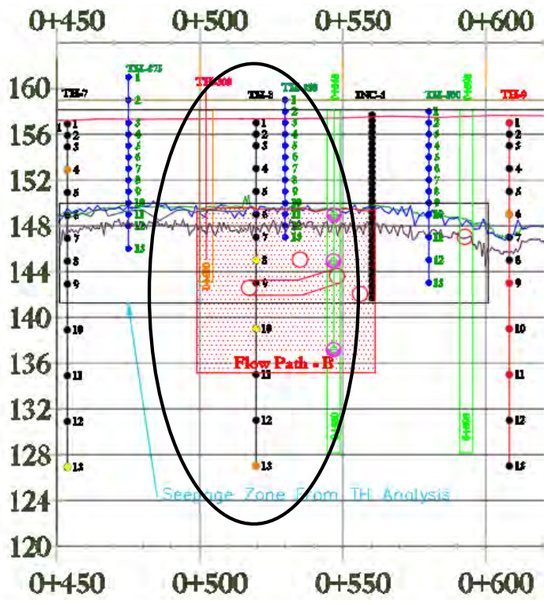
LEGEND :
- APPROVED BEDROCK
- TOP DIKE EL. 157m
- BOTTOM SECANTS PILES
- ENCOUNTERED BEDROCK BY HENRY DRILLING
- BEDROCK ENCOUNTERED DURING INJECTION CASING INSTALLATION (0.700M UPSTREAM OFFSET CENTERLINE)
- GROUTING EXTENT

WTD-TH 0+520

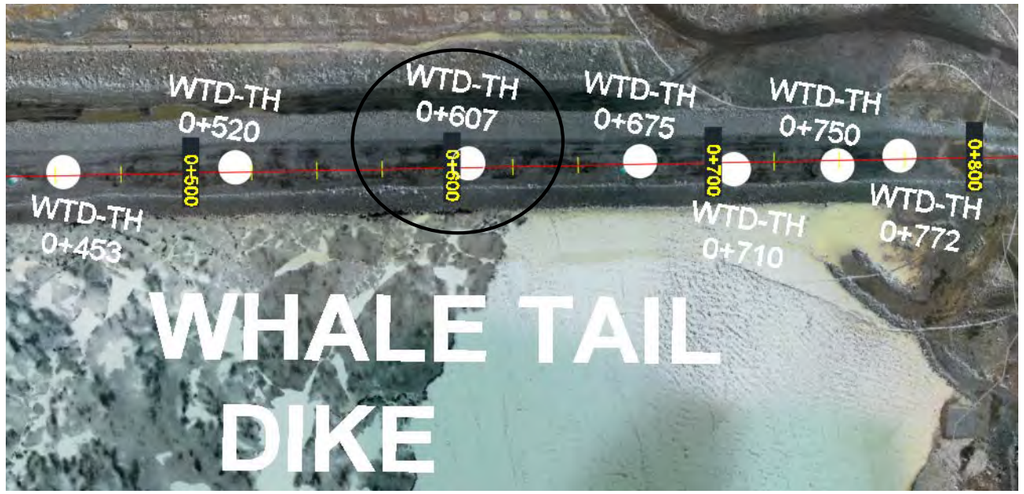

WTD-TH 0+453
WTD-TH 0+520
WTD-TH 0+607
WTD-TH 0+675
WTD-TH 0+710
WTD-TH 0+750
WTD-TH 0+772
0+500
0+600
0+700
0+800
WHALE TAIL DIKE

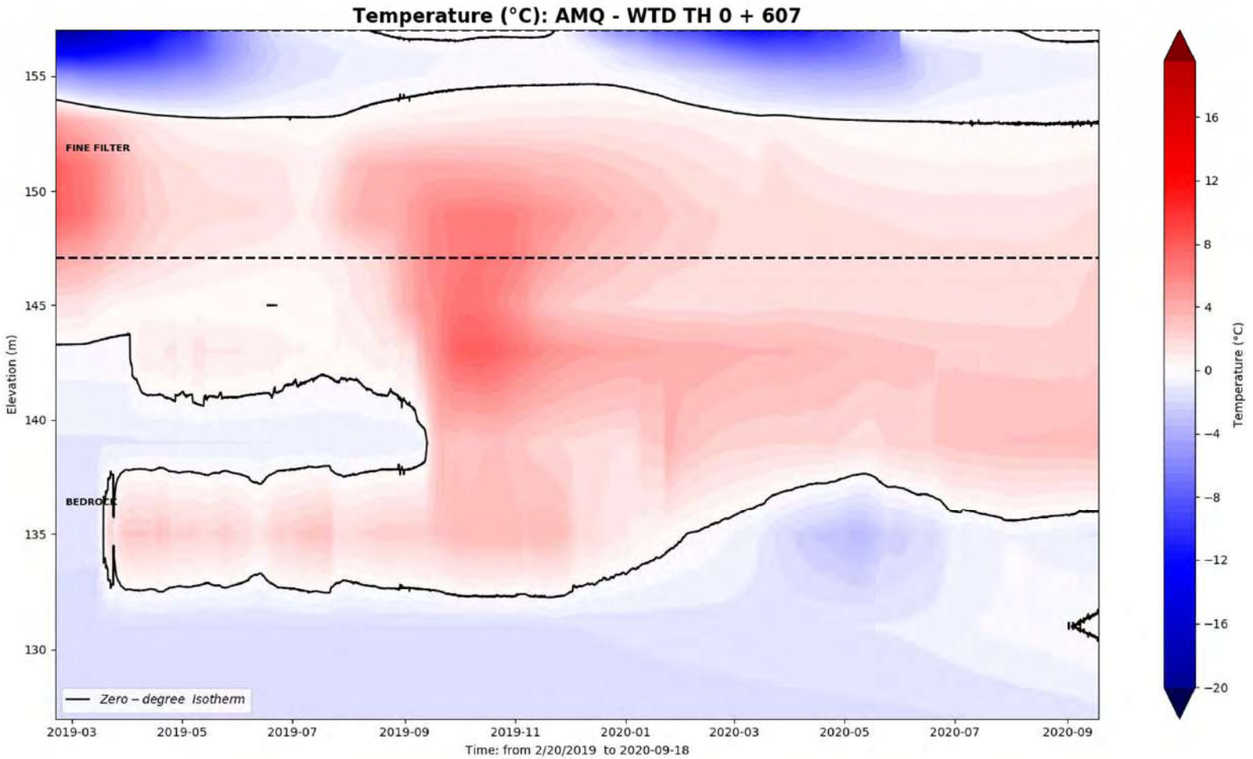

AMQ – WTD TH: 0+520
Very small capacitive effect on bead #13 only
FINE FILTER
BEDROCK
Elevation(m)
Deviation Incremental(°C)
2020-09-18 12:00
2020-08-28 12:00
2020-08-07 12:00
2020-07-17 12:00
2020-06-26 12:00
2020-06-05 12:00
2020-05-15 12:00
2020-04-24 12:00
2020-04-03 12:00
2020-03-13 12:00
2020-02-21 12:00
2020-01-31 12:00
2020-01-10 12:00
2019-12-20 12:00
2019-11-29 12:00
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2019-08-16 12:00
Limit Profile

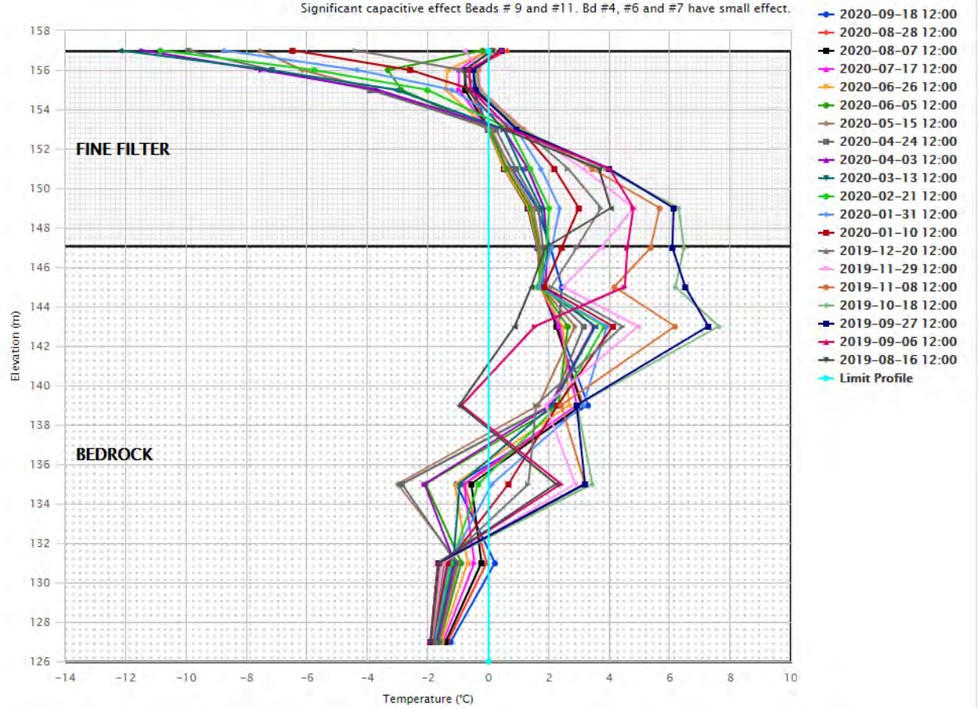

Temperature (°C): AMQ - WTD TH 0 + 520
FINE FILTER
BEDROCK
Zero – degree Isotherm
Elevation (m)
Time: from 2/19/2019 to 2020-09-18
Temperature (°C)

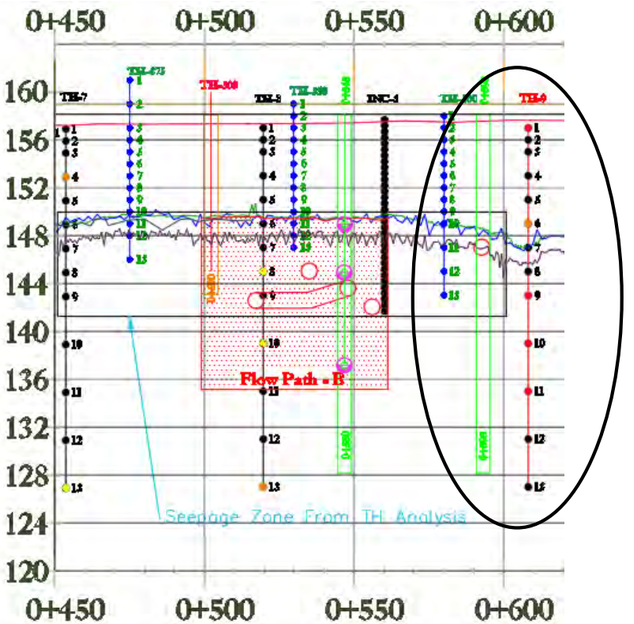

0+450
0+500
0+550
0+600
Flow Path - B
Seepage Zone from TH Analysis

WTD-TH 0+607





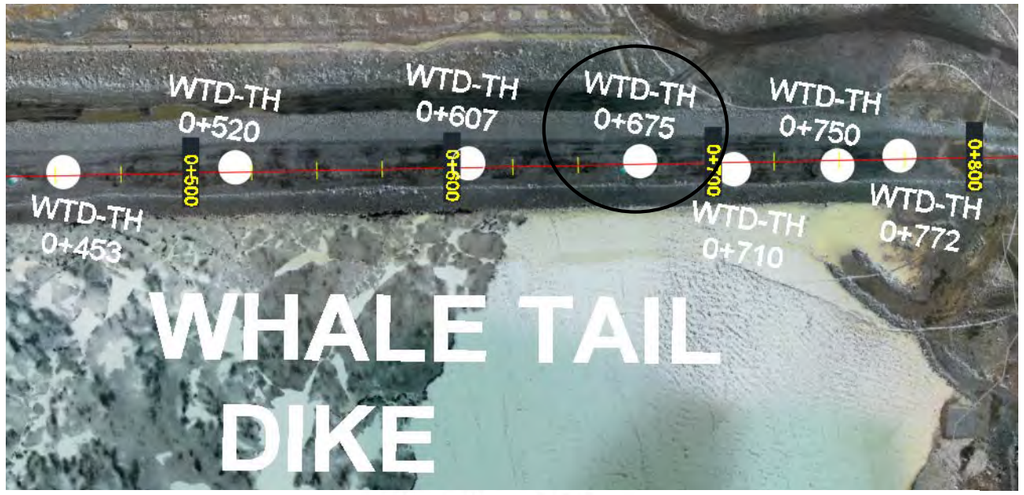




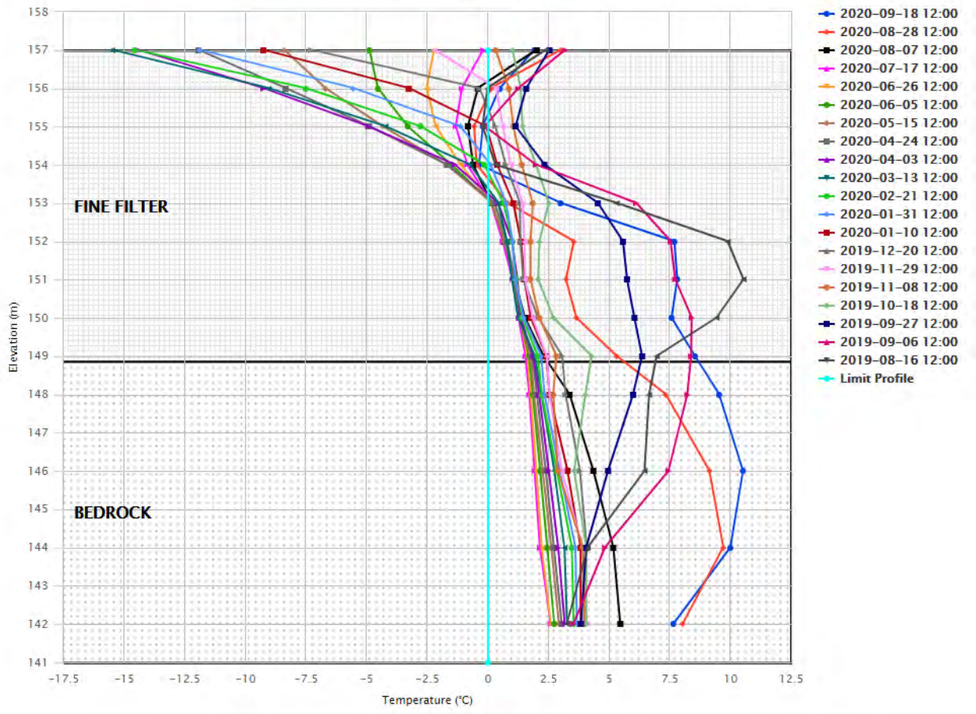
LEGEND :

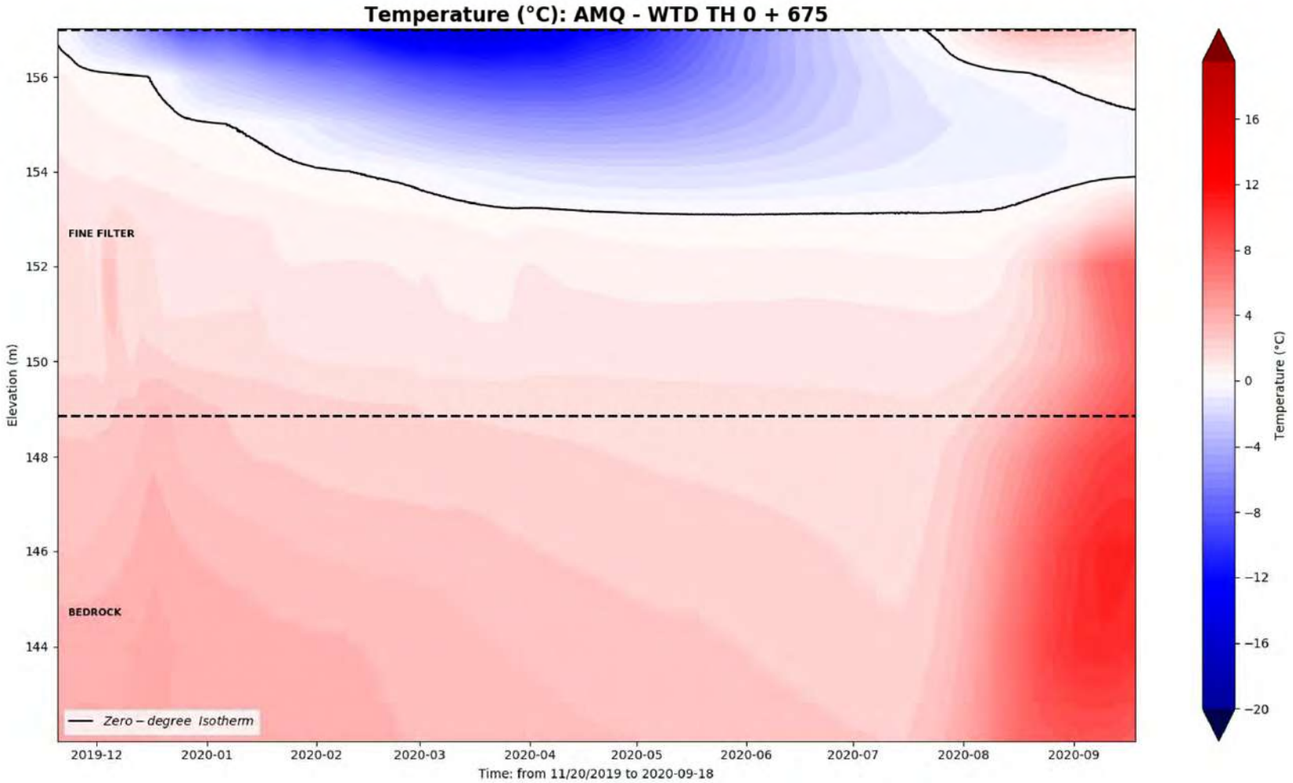
- APPROVED BEDROCK
- GROUTING EXTENT
- TOP DIKE EL. 157m
- BOTTOM SECANTS PILES
- ENCOUNTERED BEDROCK BY HENRY DRILLING
- BEDROCK ENCOUNTERED DURING INJECTION CASING INSTALLATION (0.700M UPSTREAM OFFSET CENTERLINE)

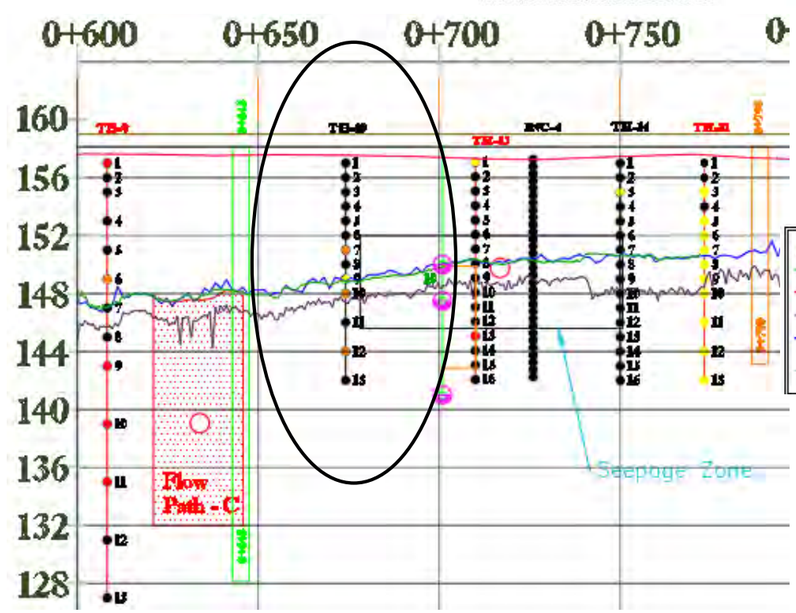
WTD-TH 0+675



AMQ – WTD TH: 0+675

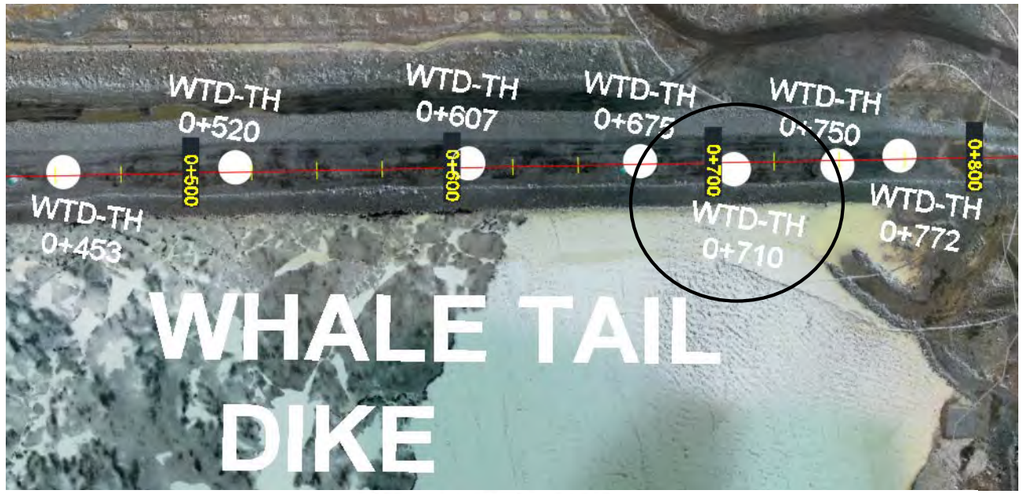


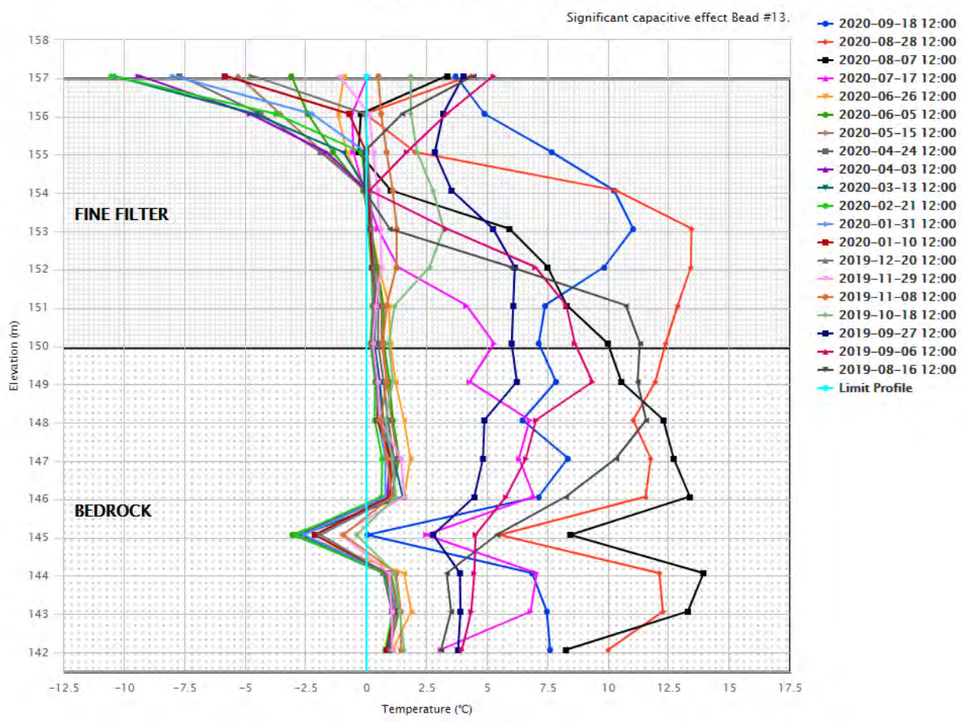


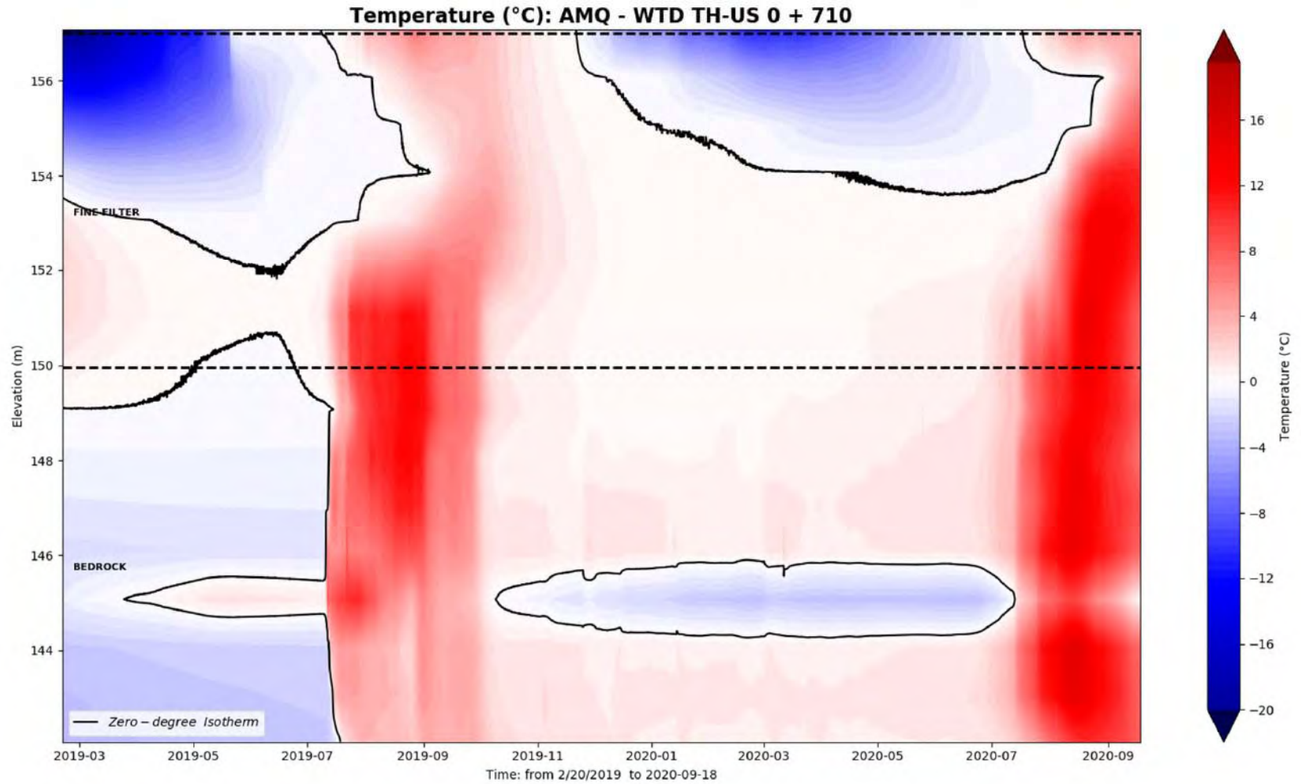


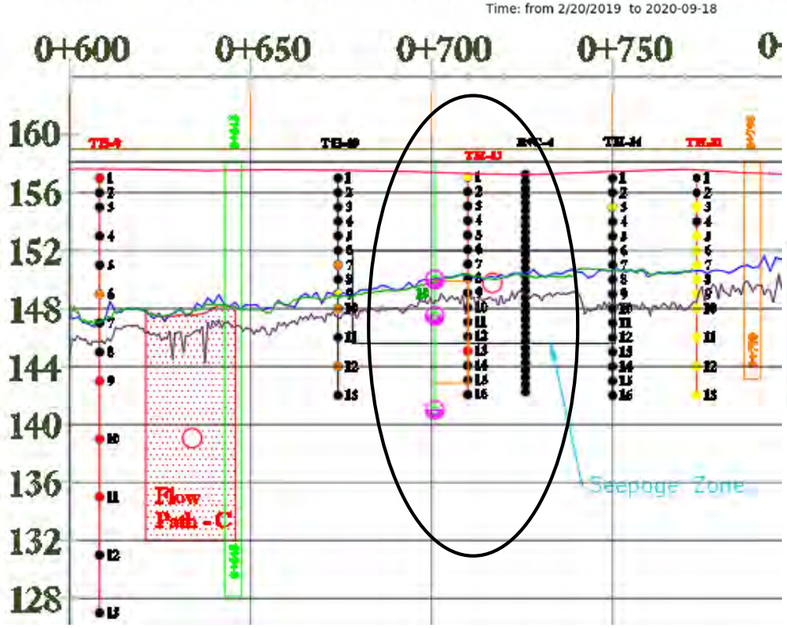
LEGEND :
- APPROVED BEDROCK
- TOP DIKE EL. 157m
- BOTTOM SECANTS PILES
- ENCOUNTERED BEDROCK BY HENRY DRILLING
- BEDROCK ENCOUNTERED DURING INJECTION CASING INSTALLATION (0.700M UPSTREAM OFFSET CENTERLINE)
- GROUTING EXTENT

WTD-TH 0+710 U/S



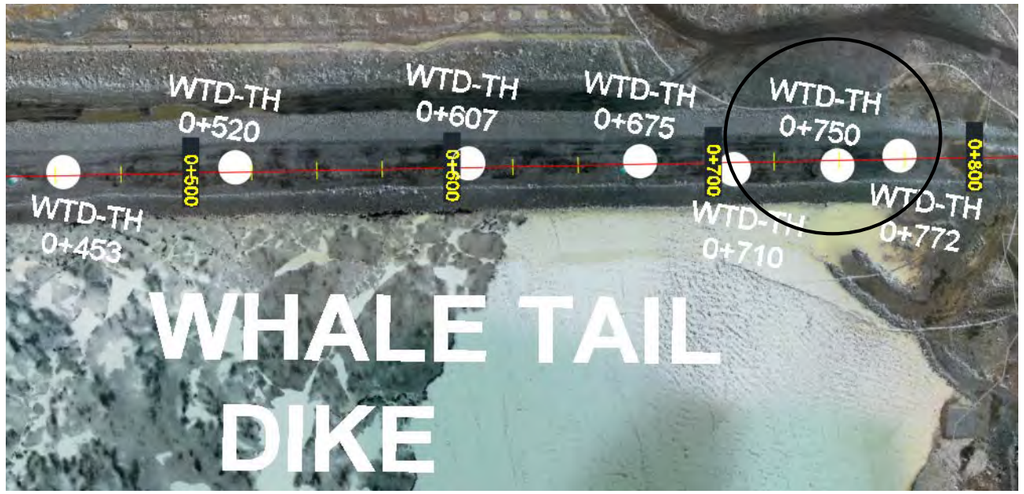


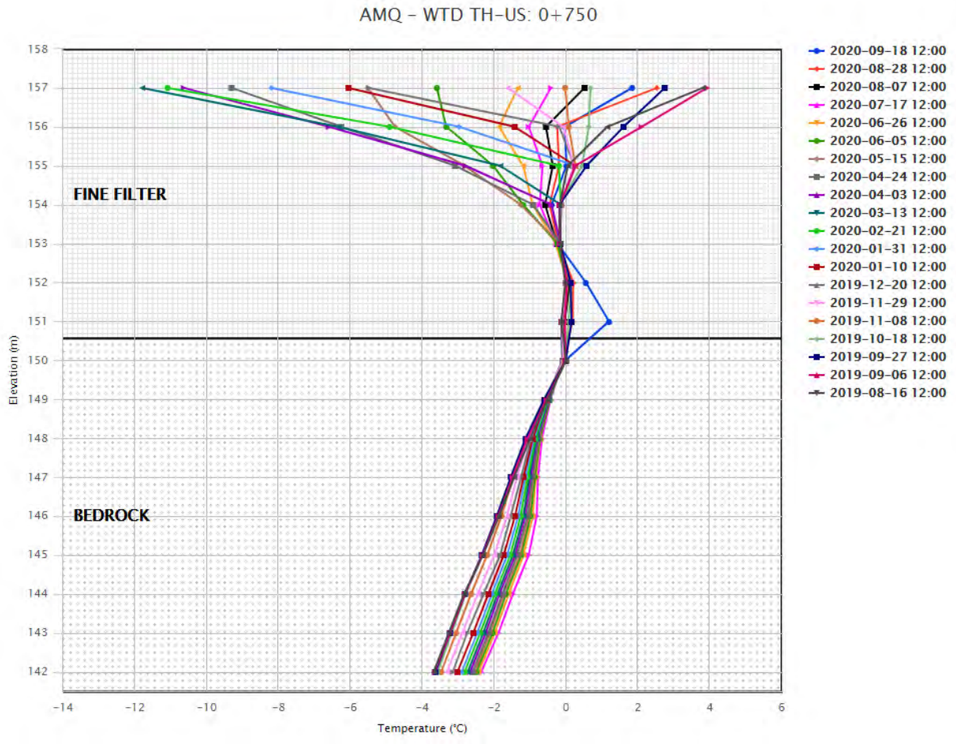


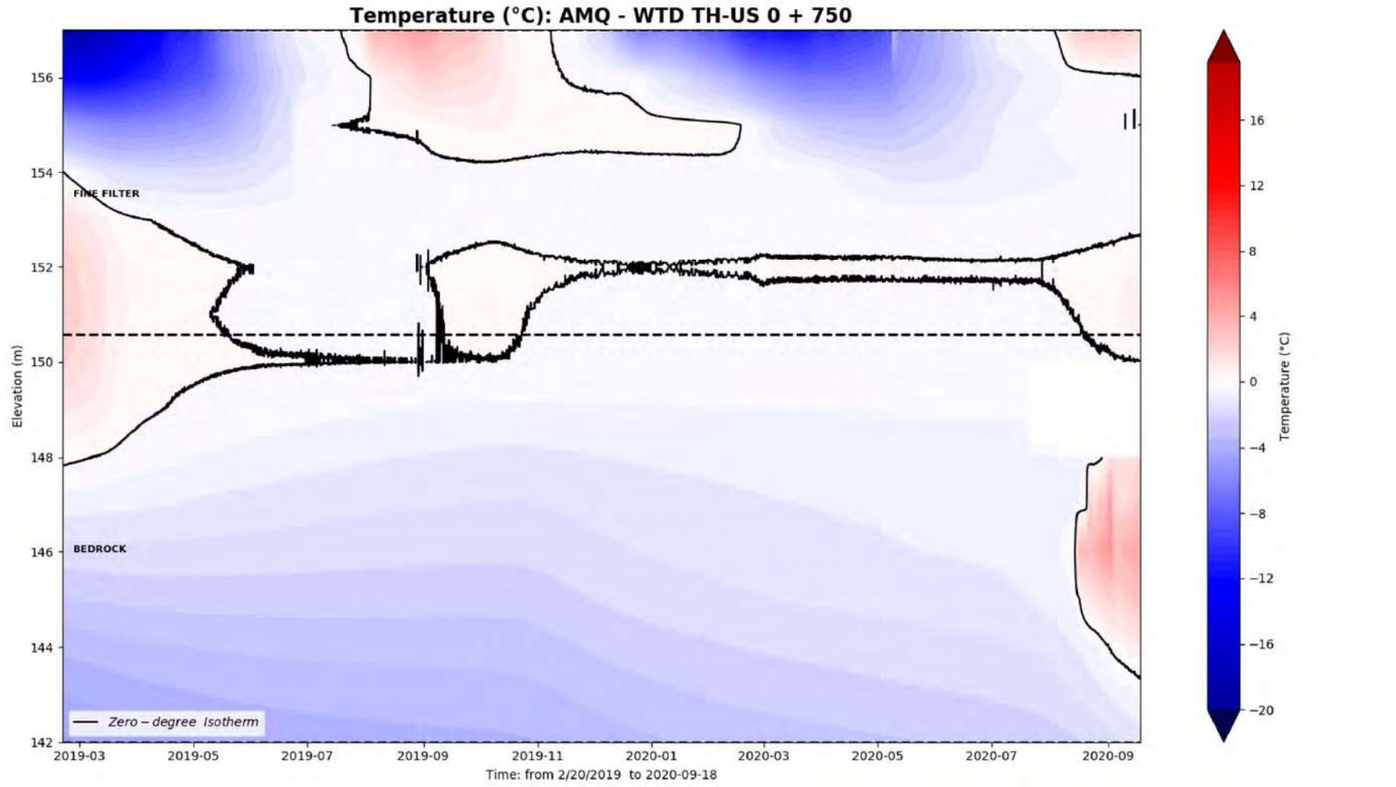


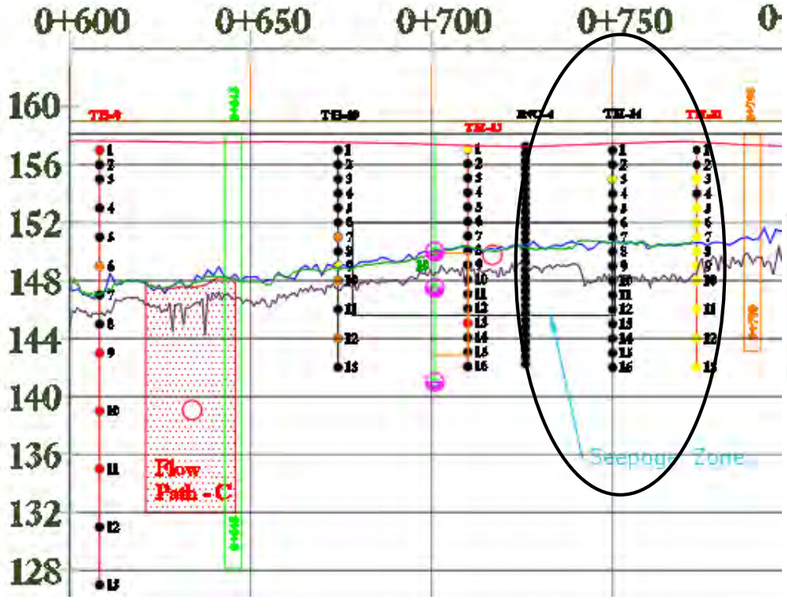
LEGEND :
- APPROVED BEDROCK
- GROUTING EXTENT
- TOP DIKE EL. 157m
- BOTTOM SECANTS PILES
- ENCOUNTERED BEDROCK BY HENRY DRILLING
- BEDROCK ENCOUNTERED DURING INJECTION CASING INSTALLATION (0.700M UPSTREAM OFFSET CENTERLINE)

WTD-TH 0+750 U/S



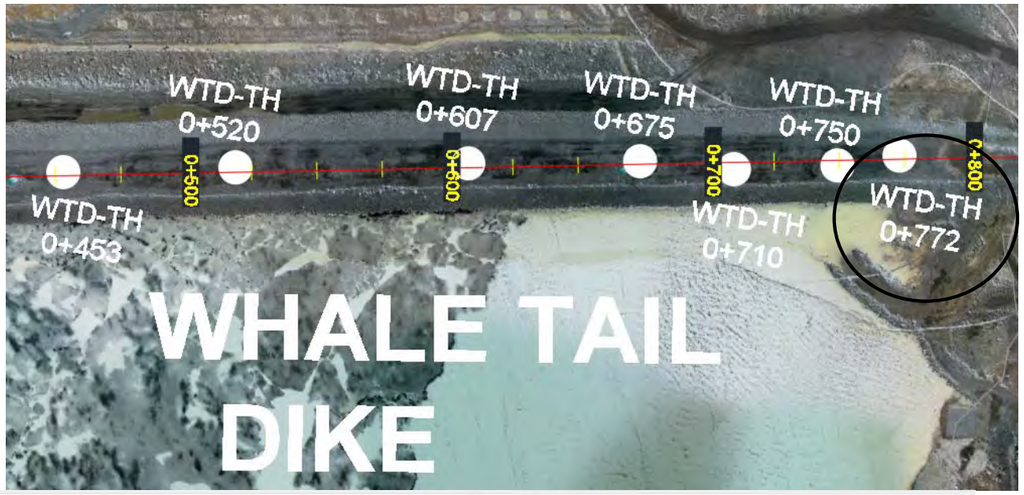


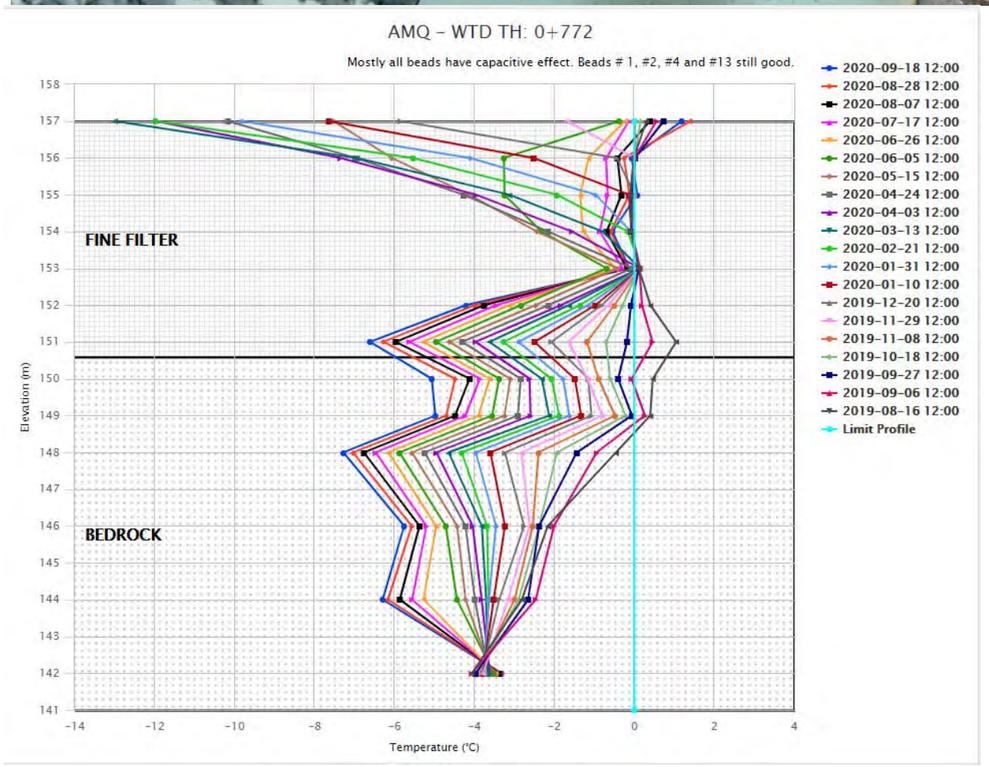


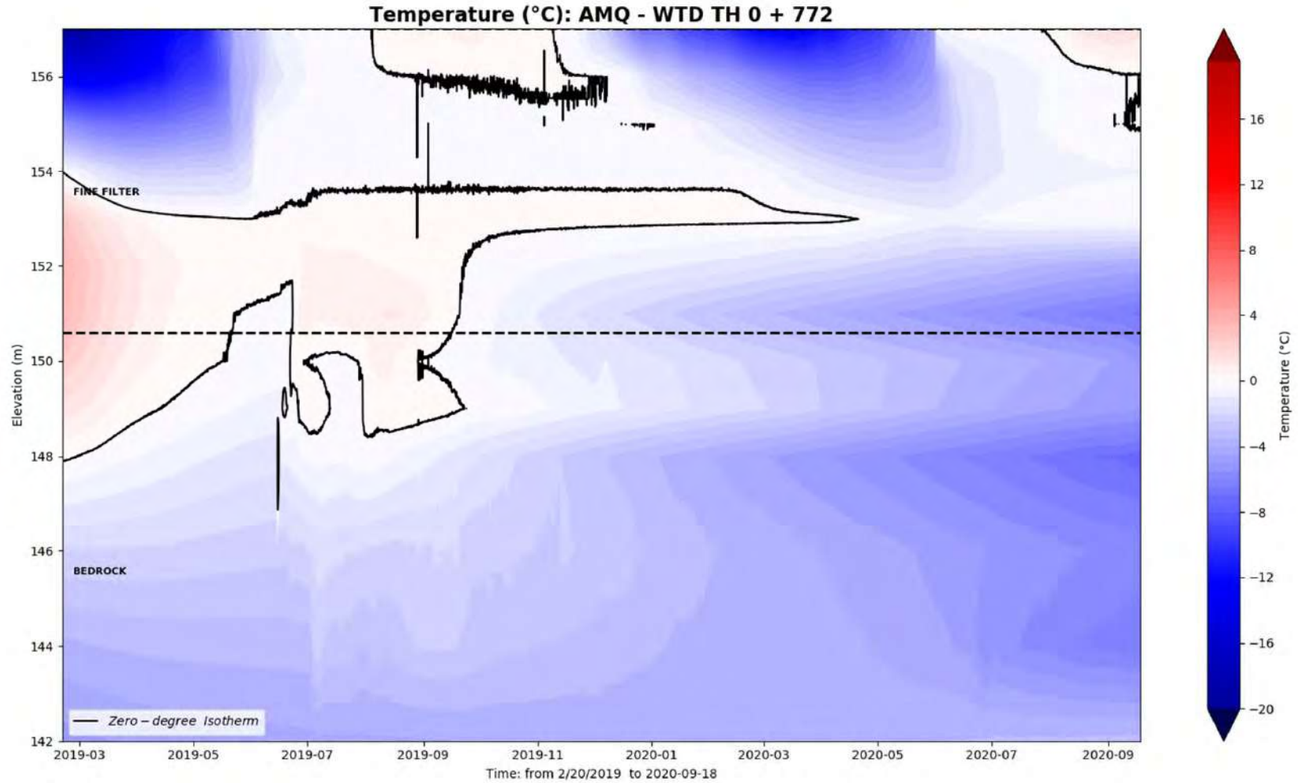


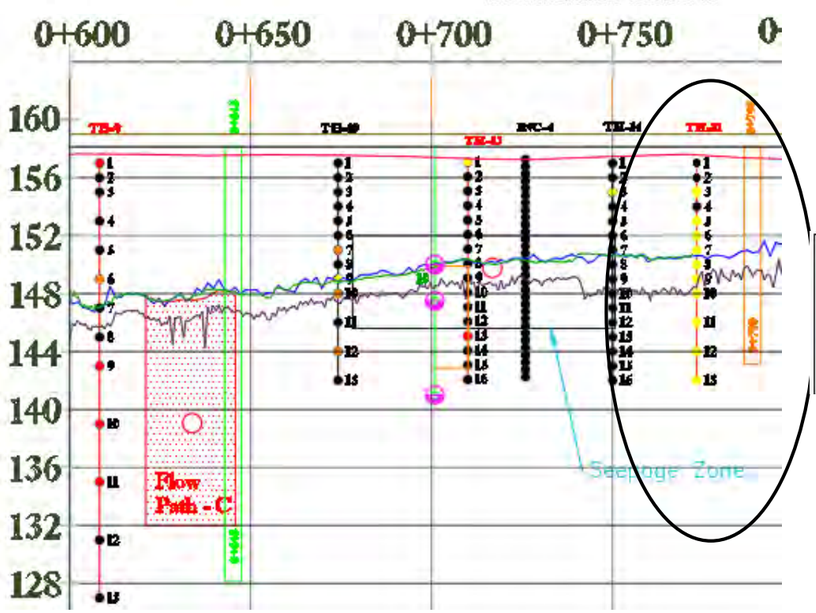
LEGEND :
- APPROVED BEDROCK
- TOP DIKE EL. 157m
- BOTTOM SECANTS PILES
- ENCOUNTERED BEDROCK BY HENRY DRILLING
- BEDROCK ENCOUNTERED DURING INJECTION CASING INSTALLATION (0.700M UPSTREAM OFFSET CENTERLINE)
- GROUTING EXTENT

WTD-TH 0+772



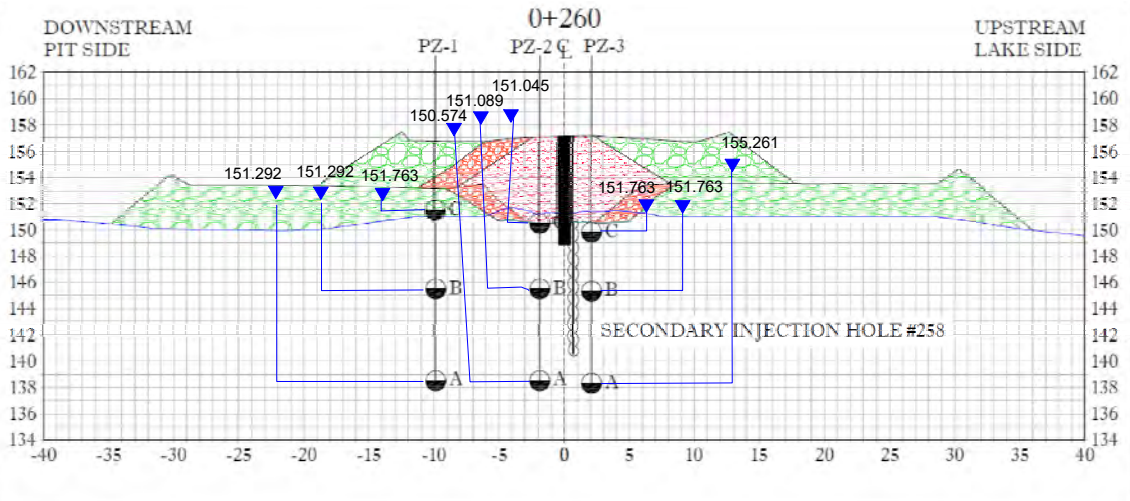




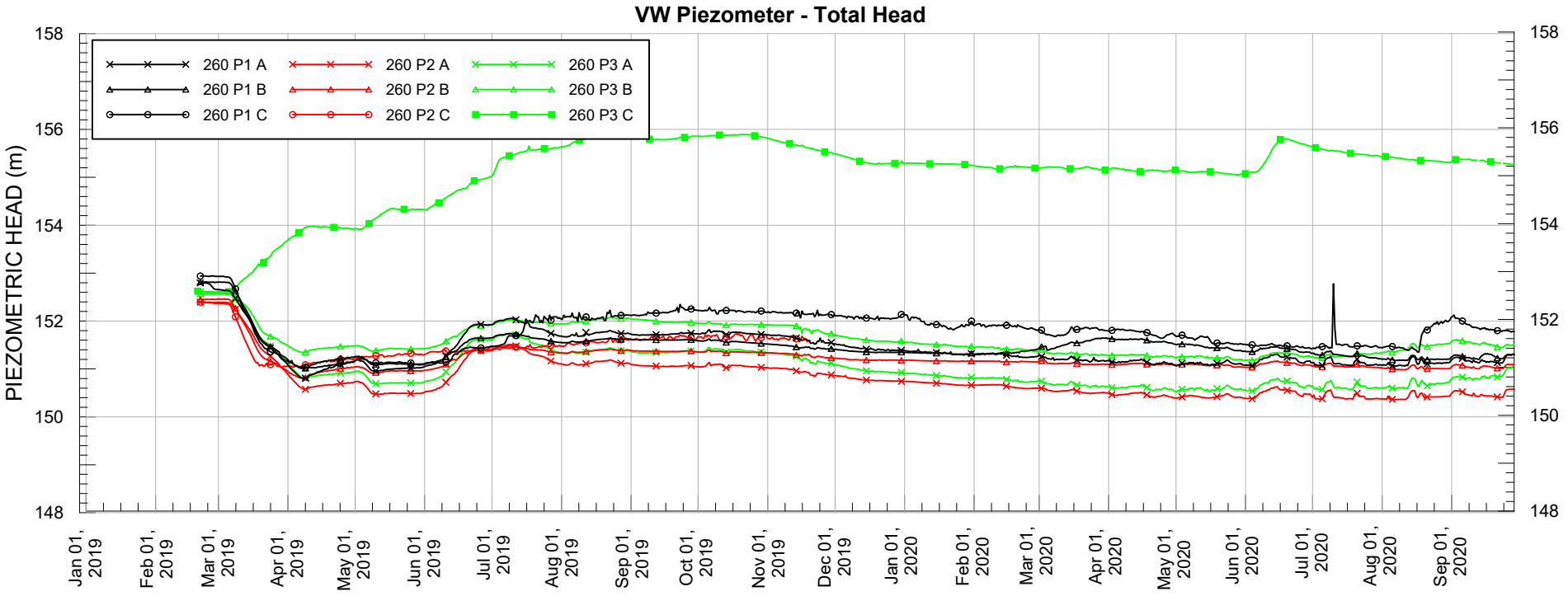


LEGEND :
- APPROVED BEDROCK
- TOP DIKE EL. 157m
- BOTTOM SECANTS PILES
- ENCOUNTERED BEDROCK BY HENRY DRILLING
- BEDROCK ENCOUNTERED DURING INJECTION CASING INSTALLATION (0.700M UPSTREAM OFFSET CENTERLINE)
- GROUTING EXTENT

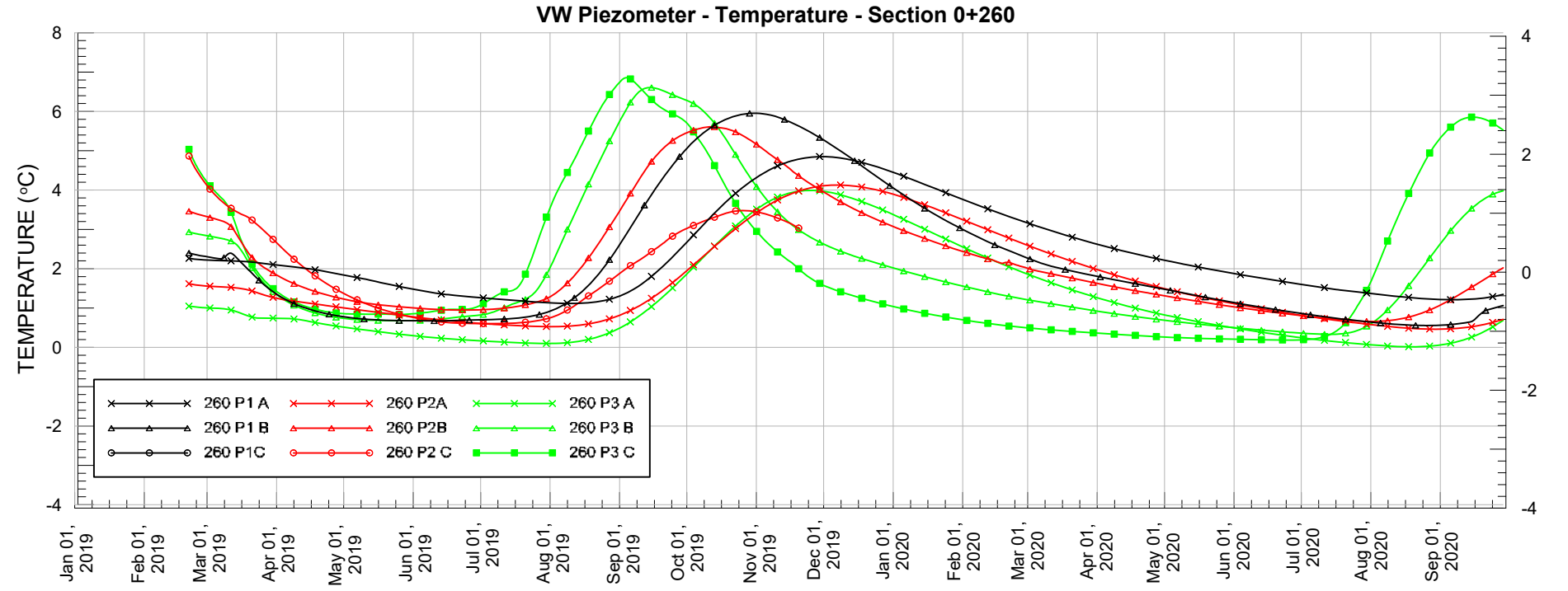
Whale Tail Dike - Section 0+260



VW Piezometer - Total Head



VW Piezometer - Temperature - Section 0+260



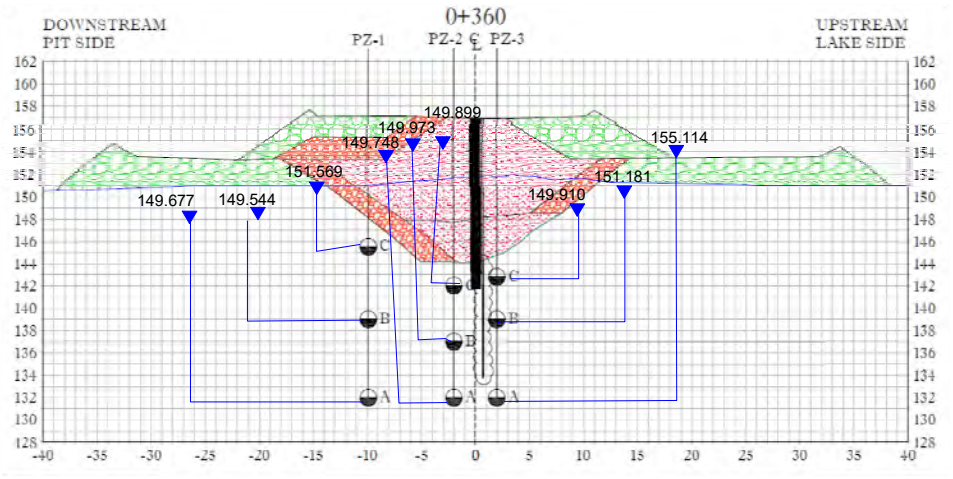
PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE: WHALE TAIL DIKE
Section 0+260 - PIEZOMETRIC DATA
(Jan 1/19 to Sept 29/20)

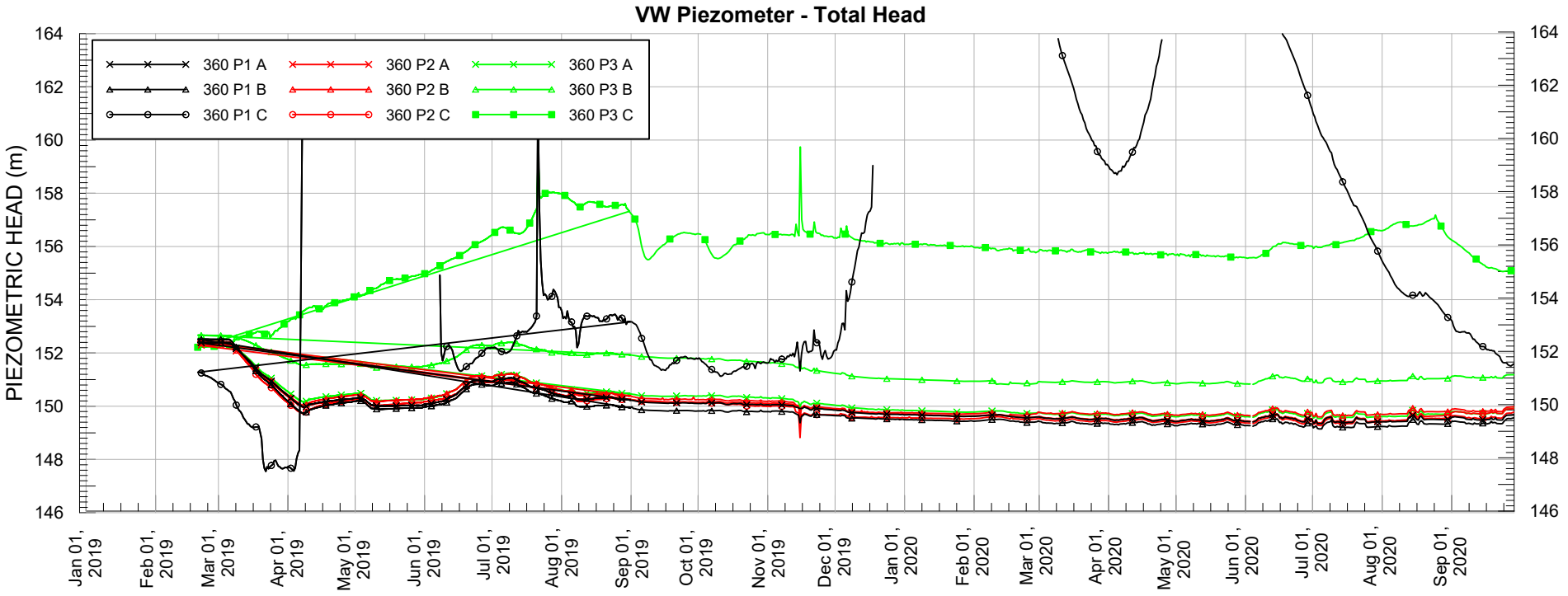
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	FIGURE 1	
REVIEW				

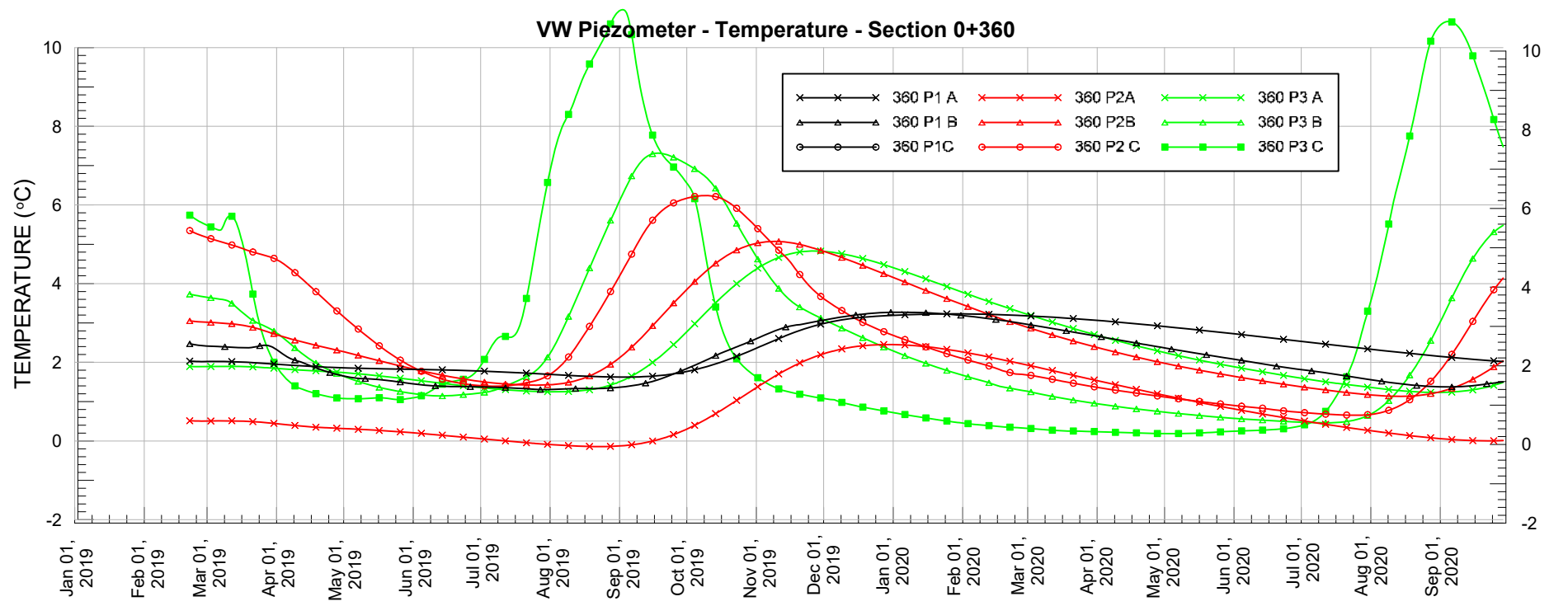
Whale Tail Dike - Section 0+360



VW Piezometer - Total Head



VW Piezometer - Temperature - Section 0+360

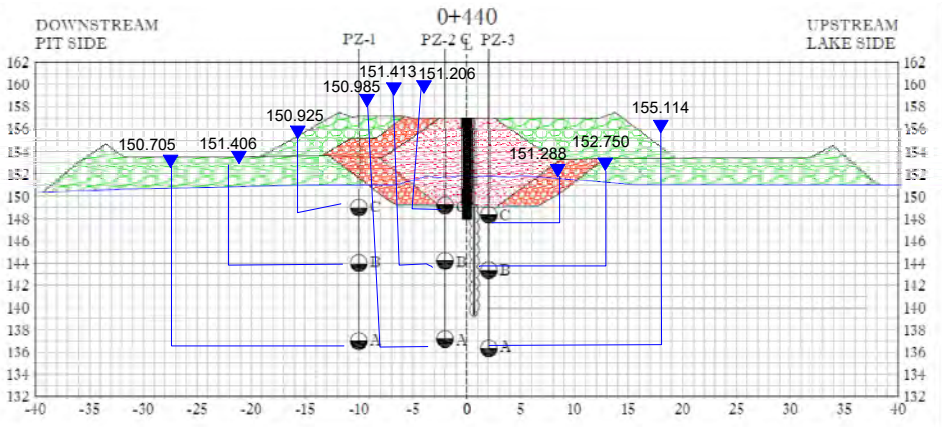


PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	WHALE TAIL DIKE Section 0+360 - PIEZOMETRIC DATA (Jan 1/19 to Sept 29/20)

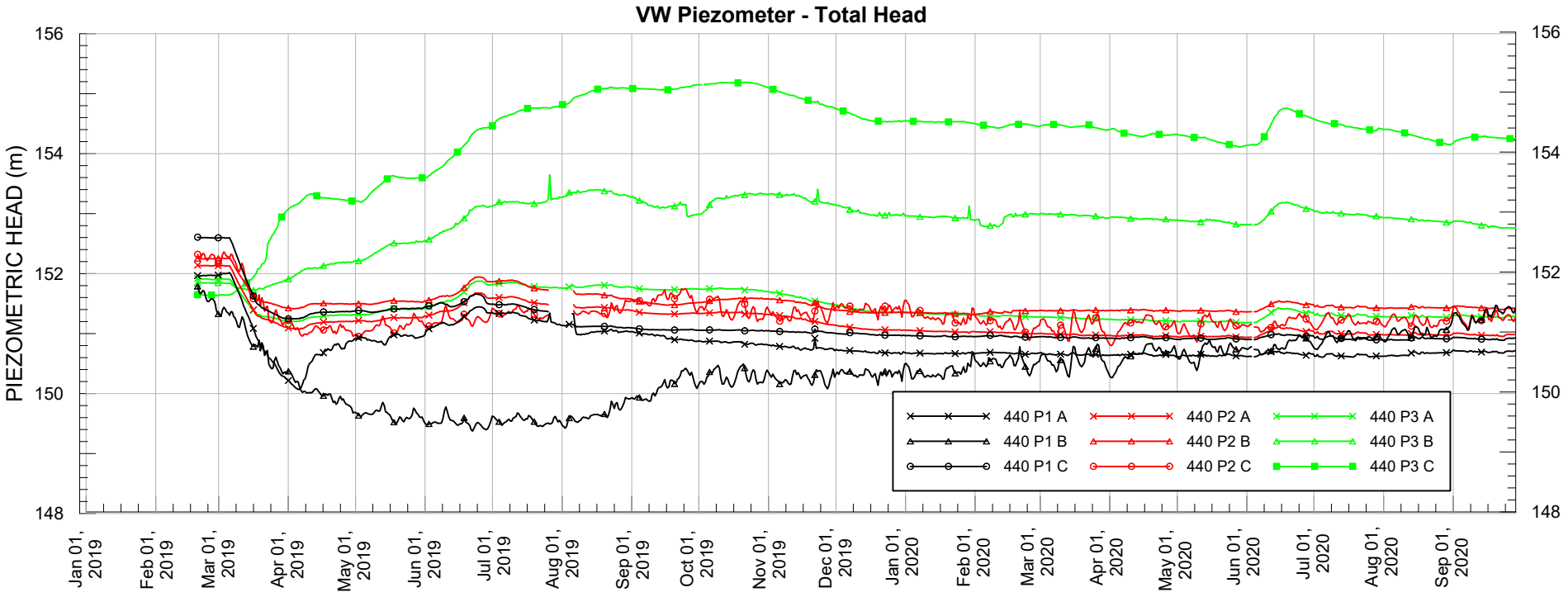
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	FIGURE 2	
REVIEW				

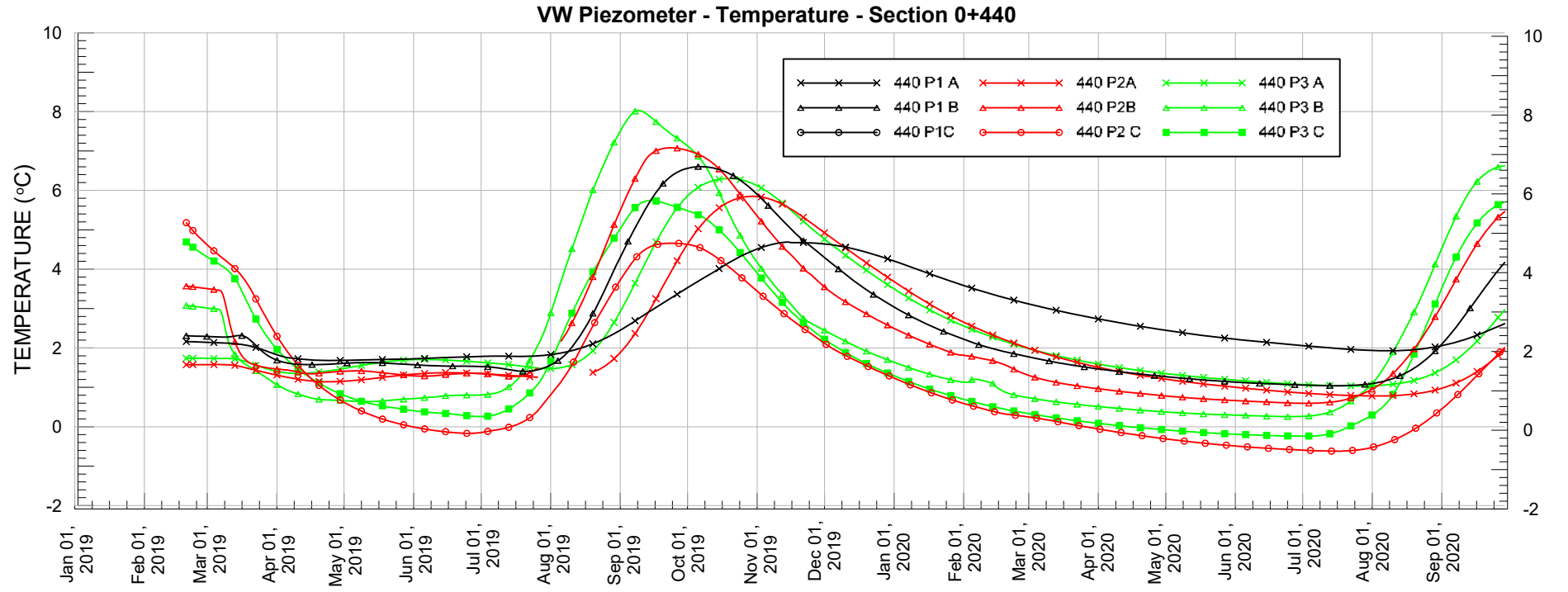
Whale Tail Dike - Section 0+440



VW Piezometer - Total Head



VW Piezometer - Temperature - Section 0+440



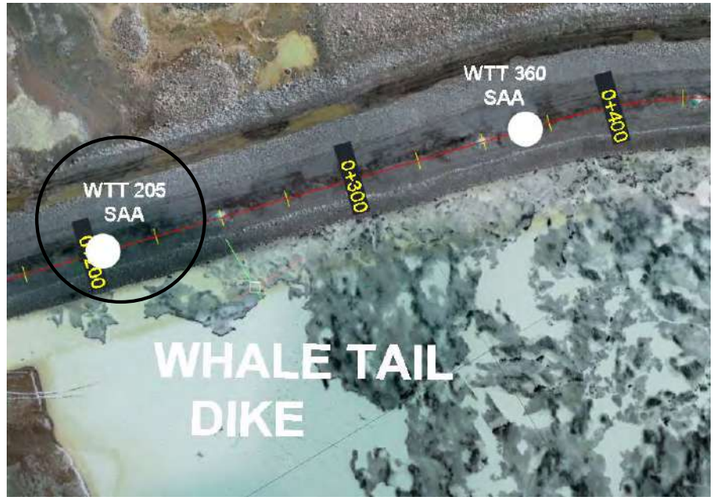
PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

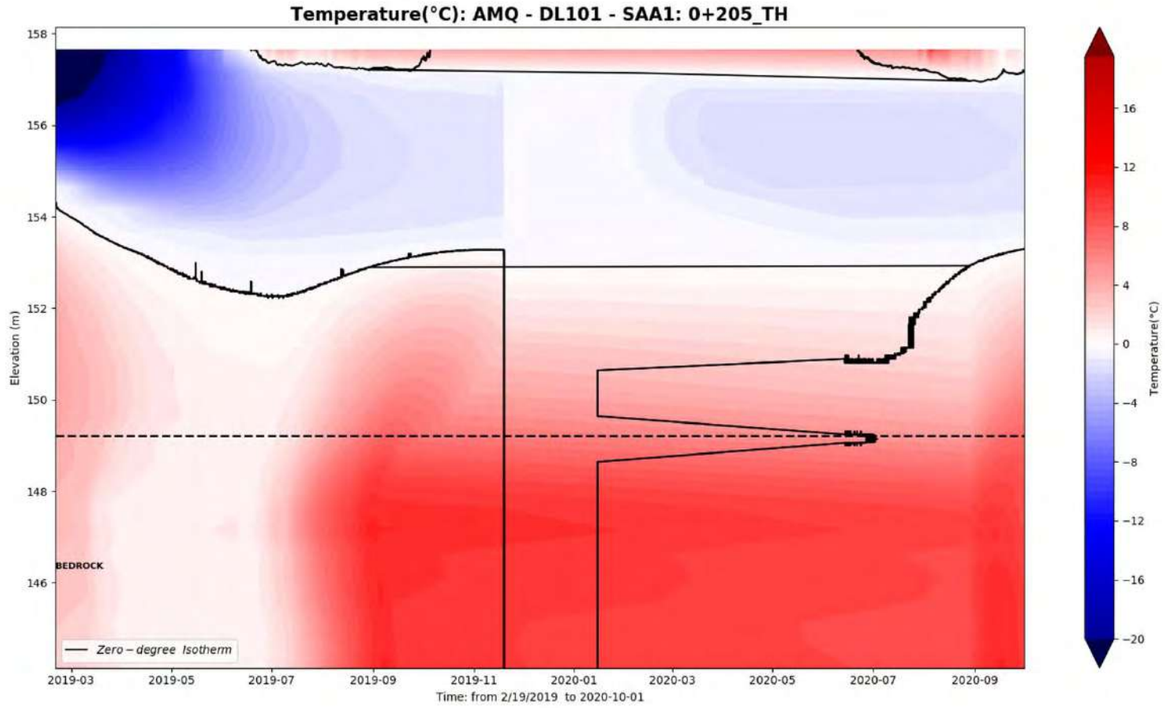
TITLE: WHALE TAIL DIKE
Section 0+440 - PIEZOMETRIC DATA
(Jan 1/19 to Sept 29/20)

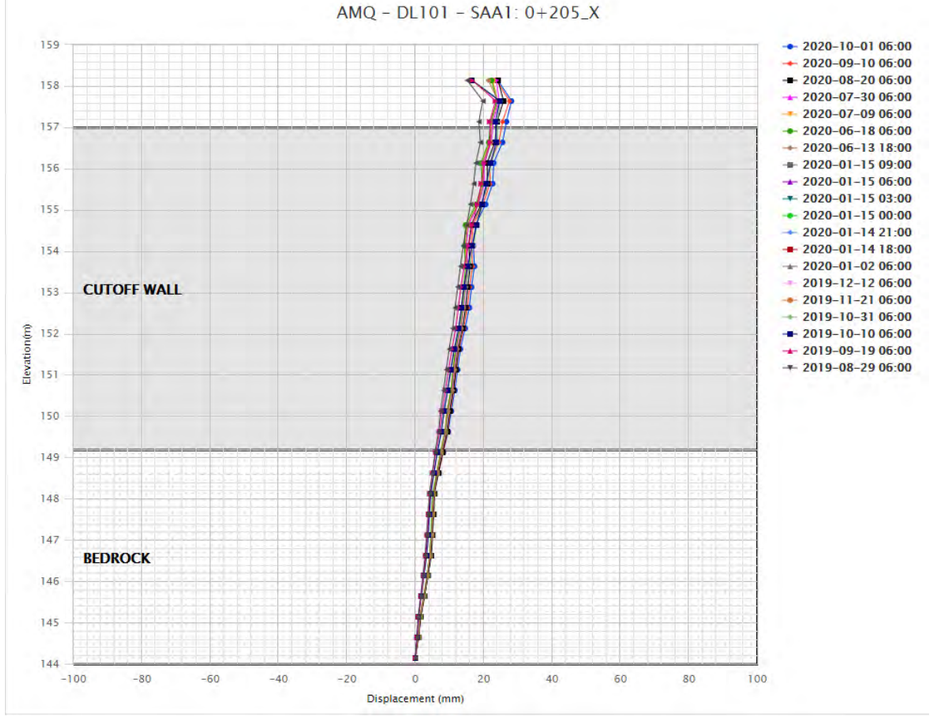
AGNICO EAGLE
MEADOWBANK

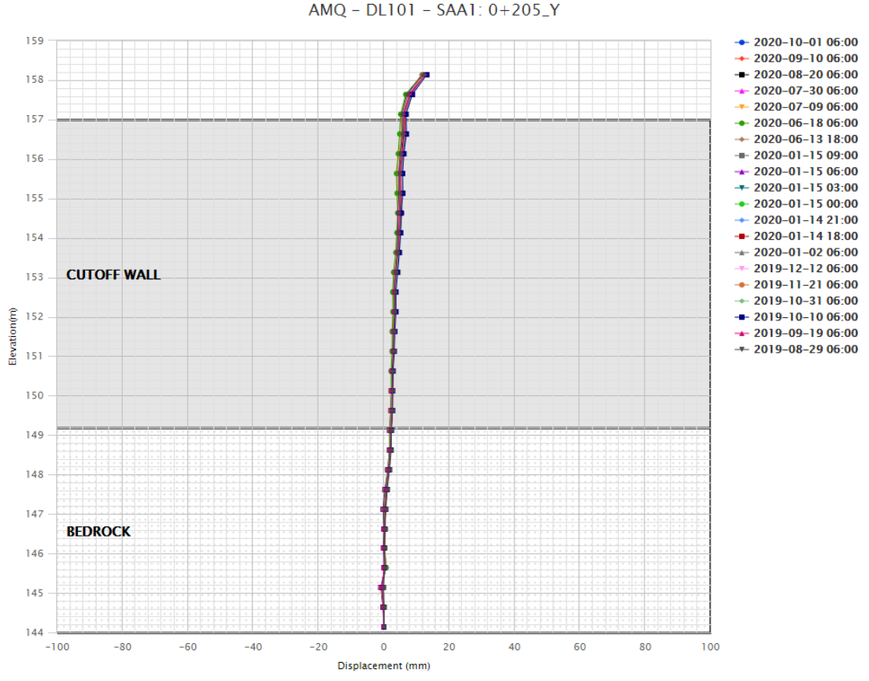
PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14	FIGURE 3	
CHECK	PG	28AUG14		
REVIEW				

WTD SAA 0+205

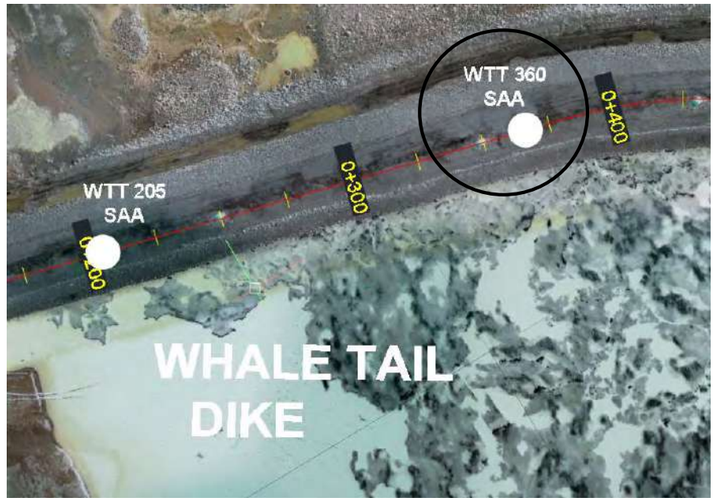

WTT 360
SAA
0+400
0+300
WTT 205
SAA
0+200
WHALE TAIL
DIKE

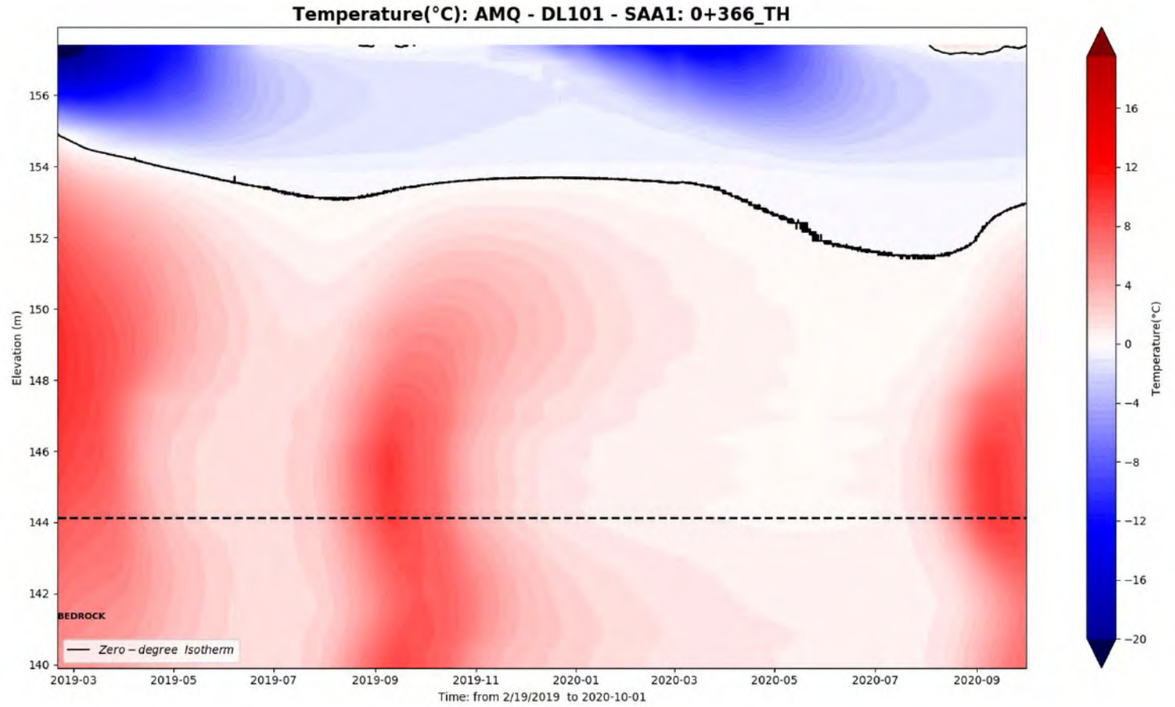

Temperature(°C): AMQ - DL101 - SAA1: 0+205_TH
Elevation (m)
Time: from 2/19/2019 to 2020-10-01
Temperature(°C)
BEDROCK
Zero – degree Isotherm

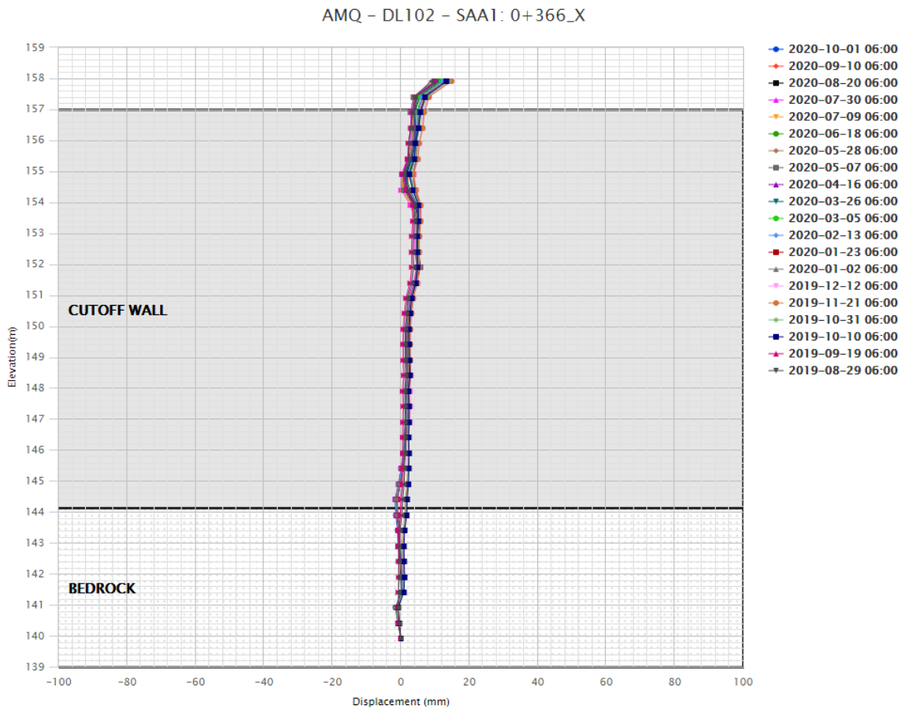

AMQ - DL101 - SAA1: 0+205_X
Elevation(m)
Displacement (mm)
CUTOFF WALL
BEDROCK
2020-10-01 06:00
2020-09-10 06:00
2020-08-20 06:00
2020-07-30 06:00
2020-07-09 06:00
2020-06-18 06:00
2020-06-13 18:00
2020-01-15 09:00
2020-01-15 06:00
2020-01-15 03:00
2020-01-15 00:00
2020-01-14 21:00
2020-01-14 18:00
2020-01-02 06:00
2019-12-12 06:00
2019-11-21 06:00
2019-10-31 06:00
2019-10-10 06:00
2019-09-19 06:00
2019-08-29 06:00

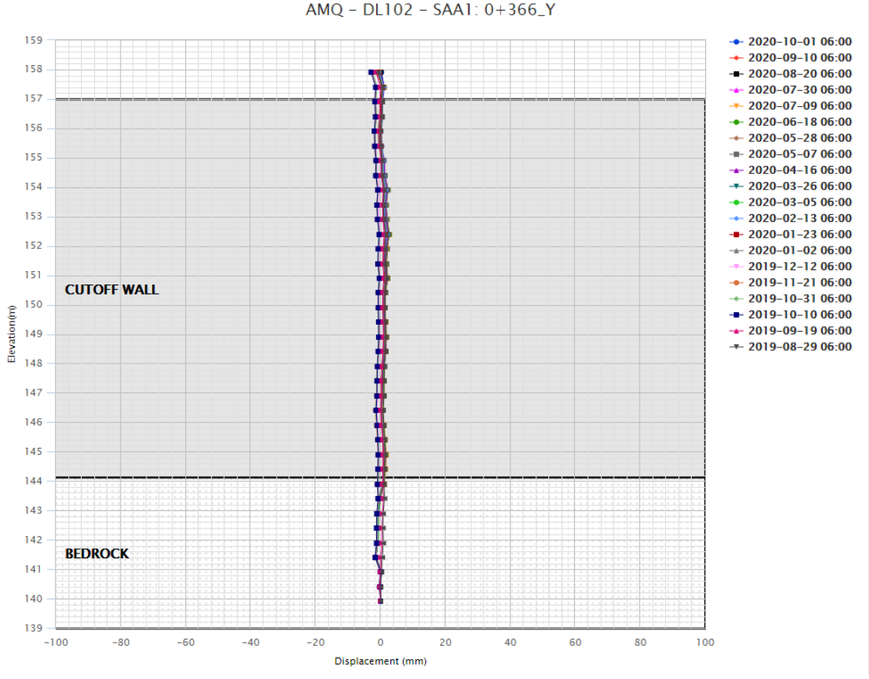

AMQ - DL101 - SAA1: 0+205_Y
Elevation(m)
Displacement (mm)
CUTOFF WALL
BEDROCK
2020-10-01 06:00
2020-09-10 06:00
2020-08-20 06:00
2020-07-30 06:00
2020-07-09 06:00
2020-06-18 06:00
2020-06-13 18:00
2020-01-15 09:00
2020-01-15 06:00
2020-01-15 03:00
2020-01-15 00:00
2020-01-14 21:00
2020-01-14 18:00
2020-01-02 06:00
2019-12-12 06:00
2019-11-21 06:00
2019-10-31 06:00
2019-10-10 06:00
2019-09-19 06:00
2019-08-29 06:00

WTD SAA 0+366

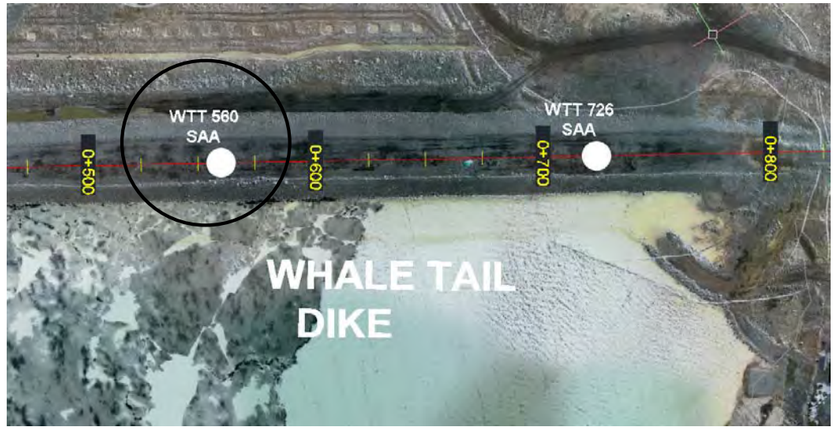

WTT 360
SAA
WTT 205
SAA
0+200
0+300
0+400
WHALE TAIL
DIKE

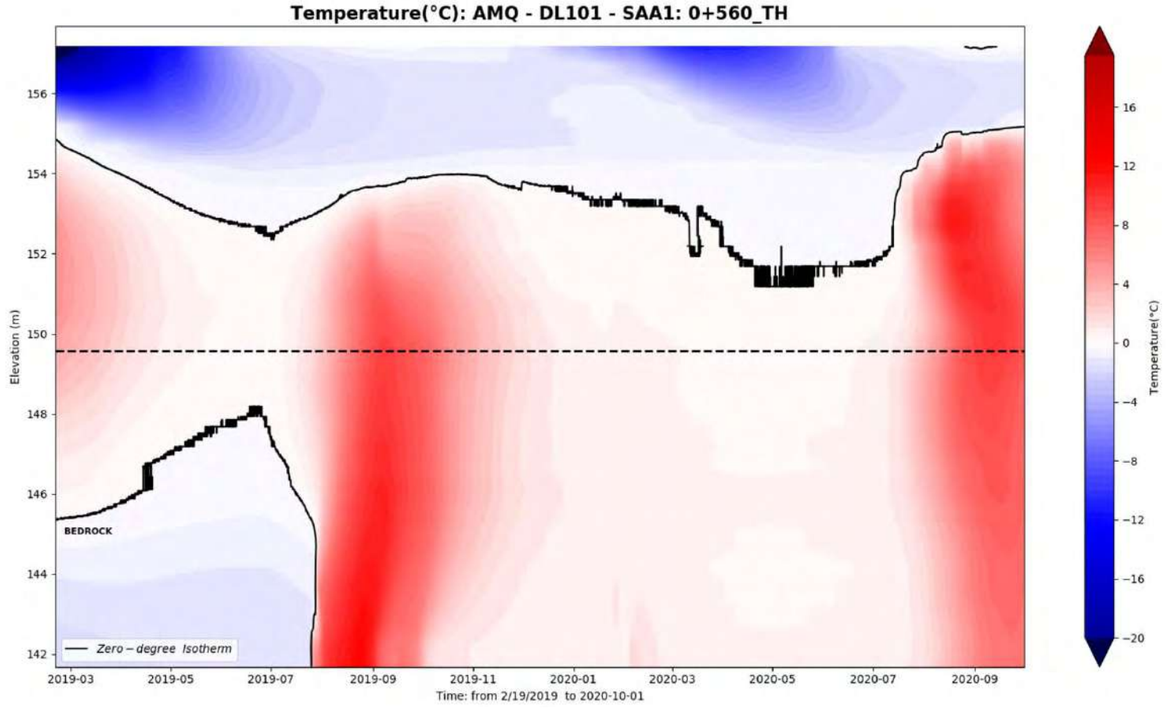

Temperature(°C): AMQ - DL101 - SAA1: 0+366_TH
Elevation (m)
Time: from 2/19/2019 to 2020-10-01
BEDROCK
Zero – degree Isotherm
Temperature(°C)

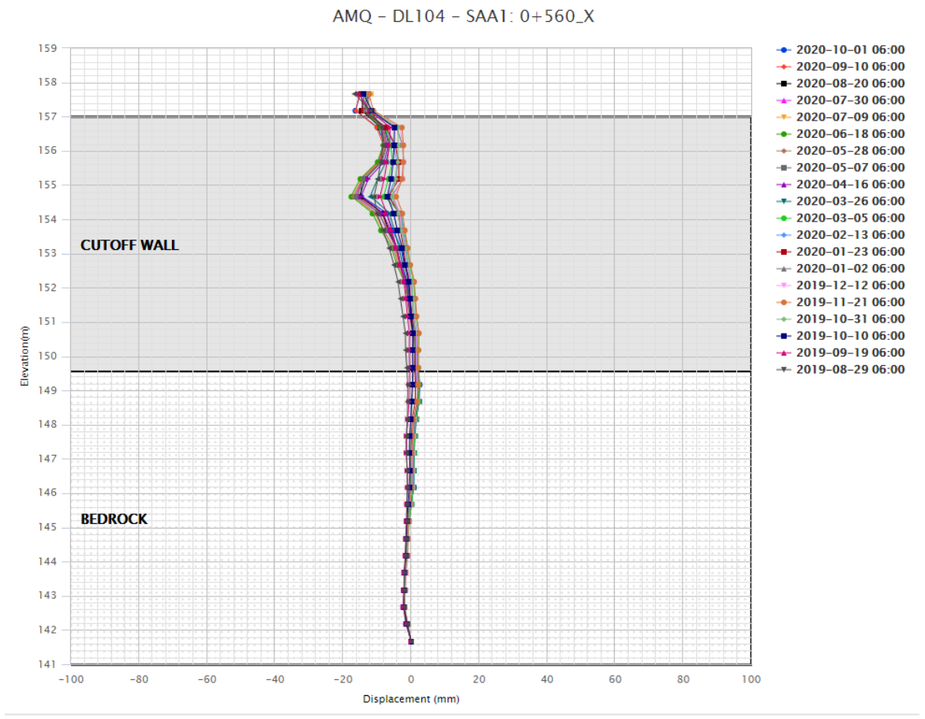

AMQ - DL102 - SAA1: 0+366_X
CUTOFF WALL
BEDROCK
Elevation(m)
Displacement (mm)
2020-10-01 06:00
2020-09-10 06:00
2020-08-20 06:00
2020-07-30 06:00
2020-07-09 06:00
2020-06-18 06:00
2020-05-28 06:00
2020-05-07 06:00
2020-04-16 06:00
2020-03-26 06:00
2020-03-05 06:00
2020-02-13 06:00
2020-01-23 06:00
2020-01-02 06:00
2019-12-12 06:00
2019-11-21 06:00
2019-10-31 06:00
2019-10-10 06:00
2019-09-19 06:00
2019-08-29 06:00

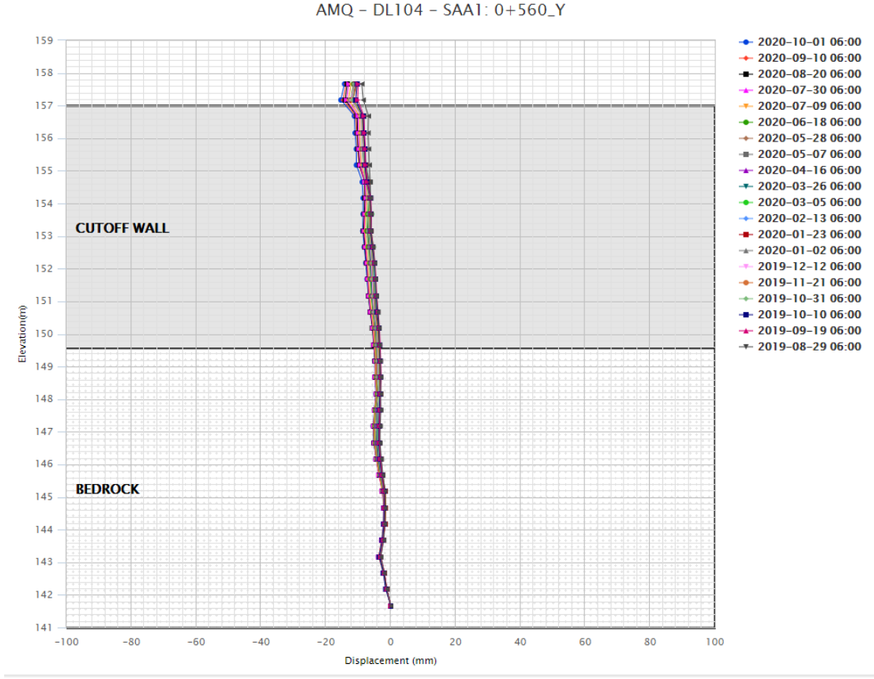

AMQ - DL102 - SAA1: 0+366_Y
CUTOFF WALL
BEDROCK
Elevation(m)
Displacement (mm)
2020-10-01 06:00
2020-09-10 06:00
2020-08-20 06:00
2020-07-30 06:00
2020-07-09 06:00
2020-06-18 06:00
2020-05-28 06:00
2020-05-07 06:00
2020-04-16 06:00
2020-03-26 06:00
2020-03-05 06:00
2020-02-13 06:00
2020-01-23 06:00
2020-01-02 06:00
2019-12-12 06:00
2019-11-21 06:00
2019-10-31 06:00
2019-10-10 06:00
2019-09-19 06:00
2019-08-29 06:00

WTD SAA 0+560

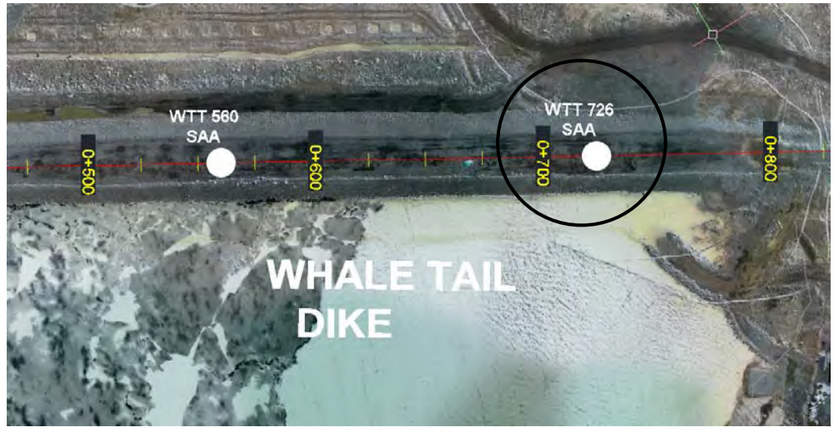

WTT 560
SAA
WTT 726
SAA
0+500
0+600
0+700
0+800
WHALE TAIL
DIKE

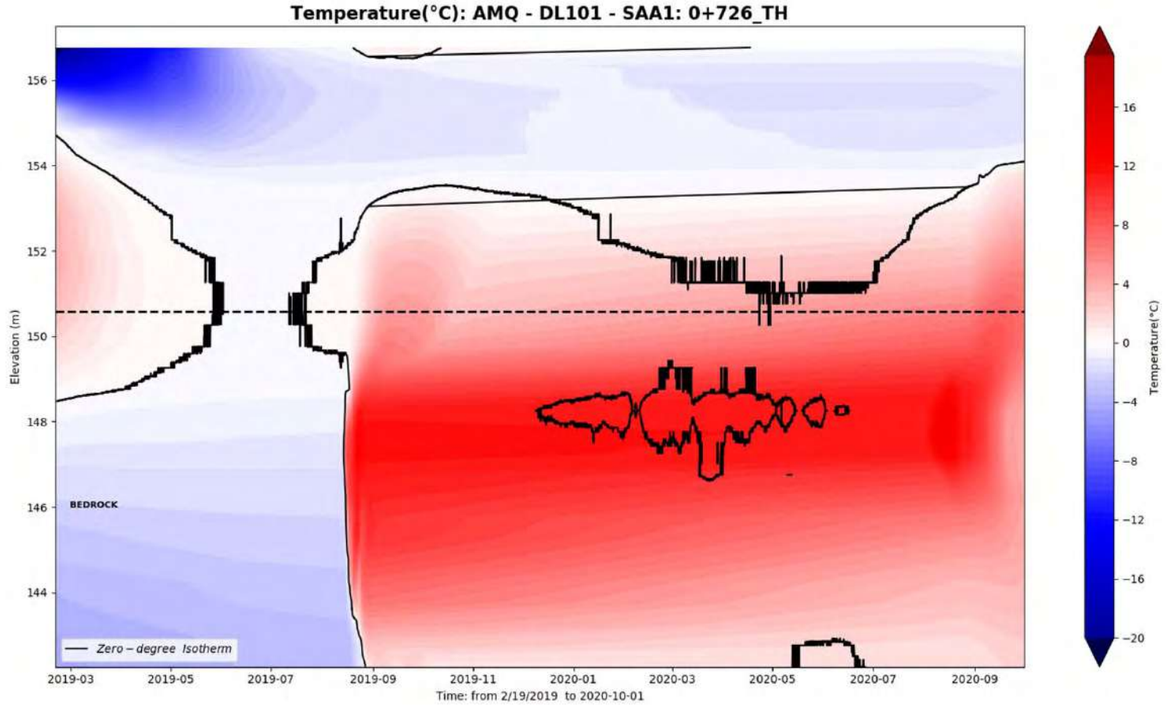

Temperature(°C): AMQ - DL101 - SAA1: 0+560_TH
Elevation (m)
Time: from 2/19/2019 to 2020-10-01
Temperature(°C)
BEDROCK
Zero – degree Isotherm

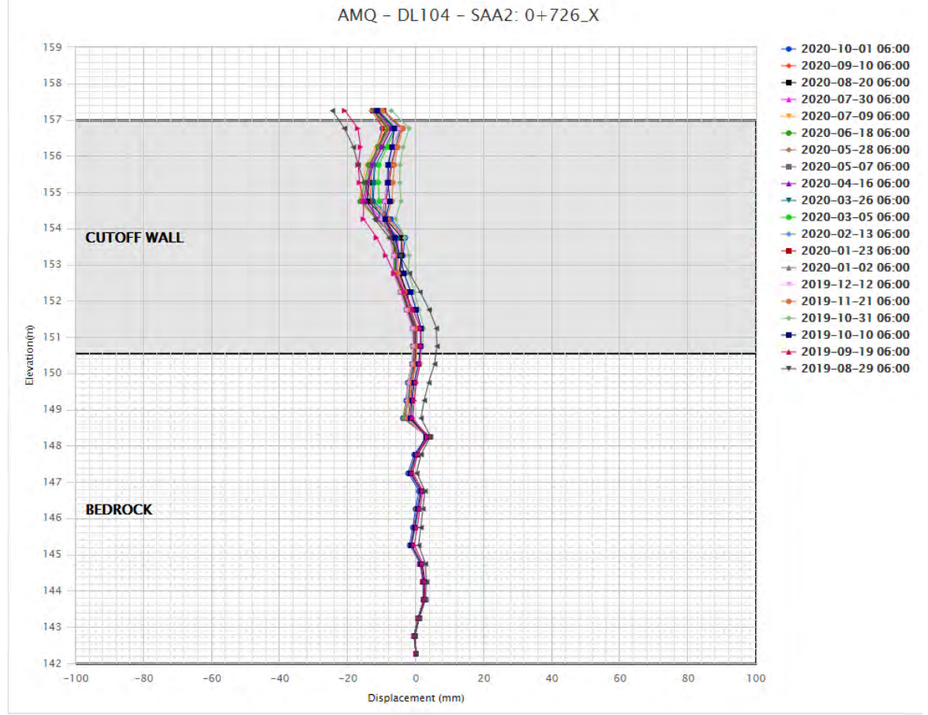

AMQ - DL104 - SAA1: 0+560_X
CUTOFF WALL
BEDROCK
Elevation(m)
Displacement (mm)
2020-10-01 06:00
2020-09-10 06:00
2020-08-20 06:00
2020-07-30 06:00
2020-07-09 06:00
2020-06-18 06:00
2020-05-28 06:00
2020-05-07 06:00
2020-04-16 06:00
2020-03-26 06:00
2020-03-05 06:00
2020-02-13 06:00
2020-01-23 06:00
2020-01-02 06:00
2019-12-12 06:00
2019-11-21 06:00
2019-10-31 06:00
2019-10-10 06:00
2019-09-19 06:00
2019-08-29 06:00

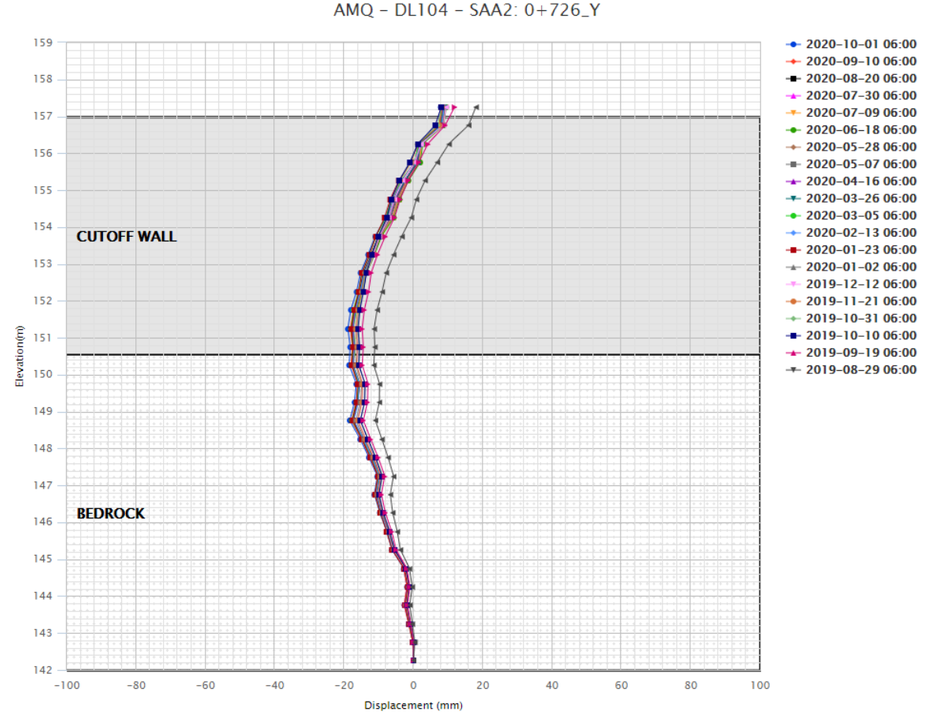

AMQ - DL104 - SAA1: 0+560_Y
CUTOFF WALL
BEDROCK
Elevation(m)
Displacement (mm)
2020-10-01 06:00
2020-09-10 06:00
2020-08-20 06:00
2020-07-30 06:00
2020-07-09 06:00
2020-06-18 06:00
2020-05-28 06:00
2020-05-07 06:00
2020-04-16 06:00
2020-03-26 06:00
2020-03-05 06:00
2020-02-13 06:00
2020-01-23 06:00
2020-01-02 06:00
2019-12-12 06:00
2019-11-21 06:00
2019-10-31 06:00
2019-10-10 06:00
2019-09-19 06:00
2019-08-29 06:00

WTD SAA 0+726


WTT 560
SAA
WTT 726
SAA
0+500
0+630
0+700
0+800
WHALE TAIL
DIKE

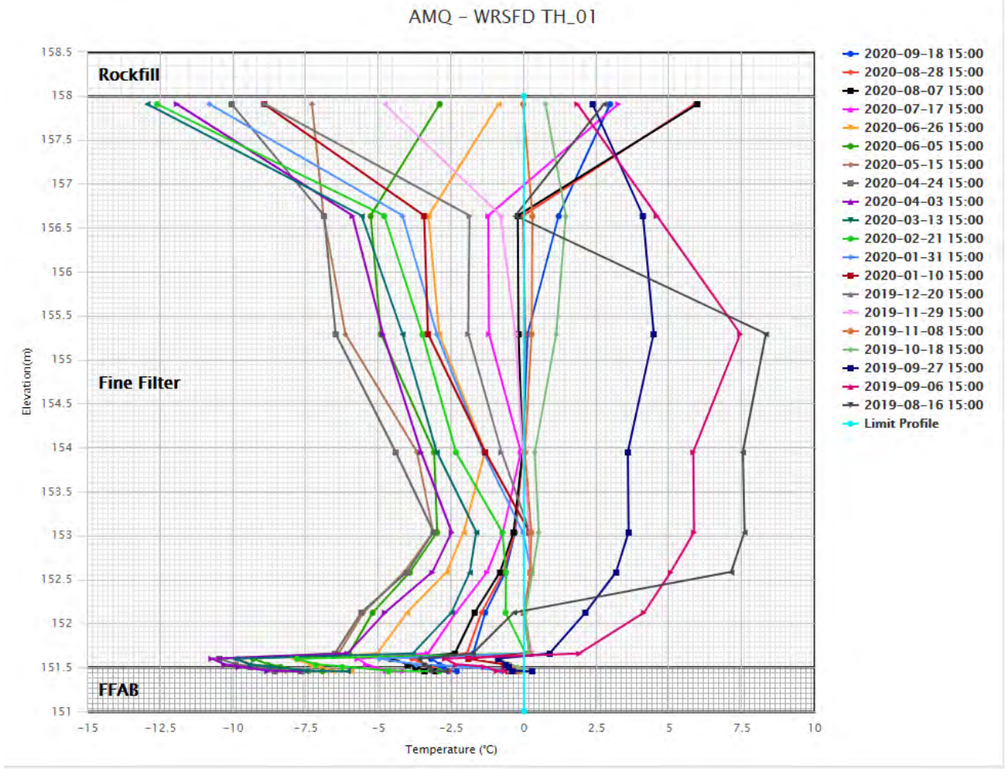

Temperature(°C): AMQ - DL101 - SAA1: 0+726_TH
Elevation (m)
Time: from 2/19/2019 to 2020-10-01
BEDROCK
Zero – degree Isotherm
Temperature(°C)

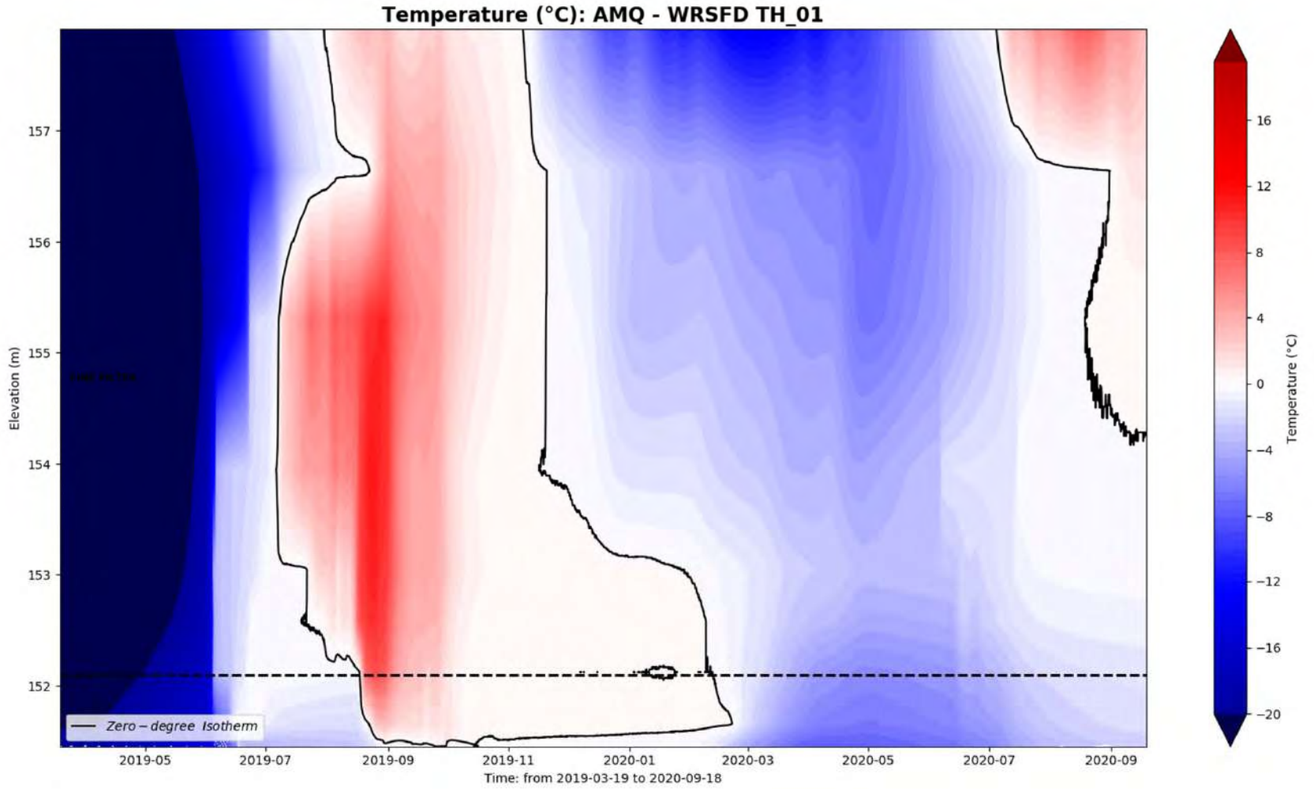

AMQ - DL104 - SAA2: 0+726_X
CUTOFF WALL
BEDROCK
Elevation(m)
Displacement (mm)
2020-10-01 06:00
2020-09-10 06:00
2020-08-20 06:00
2020-07-30 06:00
2020-07-09 06:00
2020-06-18 06:00
2020-05-28 06:00
2020-05-07 06:00
2020-04-16 06:00
2020-03-26 06:00
2020-03-05 06:00
2020-02-13 06:00
2020-01-23 06:00
2020-01-02 06:00
2019-12-12 06:00
2019-11-21 06:00
2019-10-31 06:00
2019-10-10 06:00
2019-09-19 06:00
2019-08-29 06:00

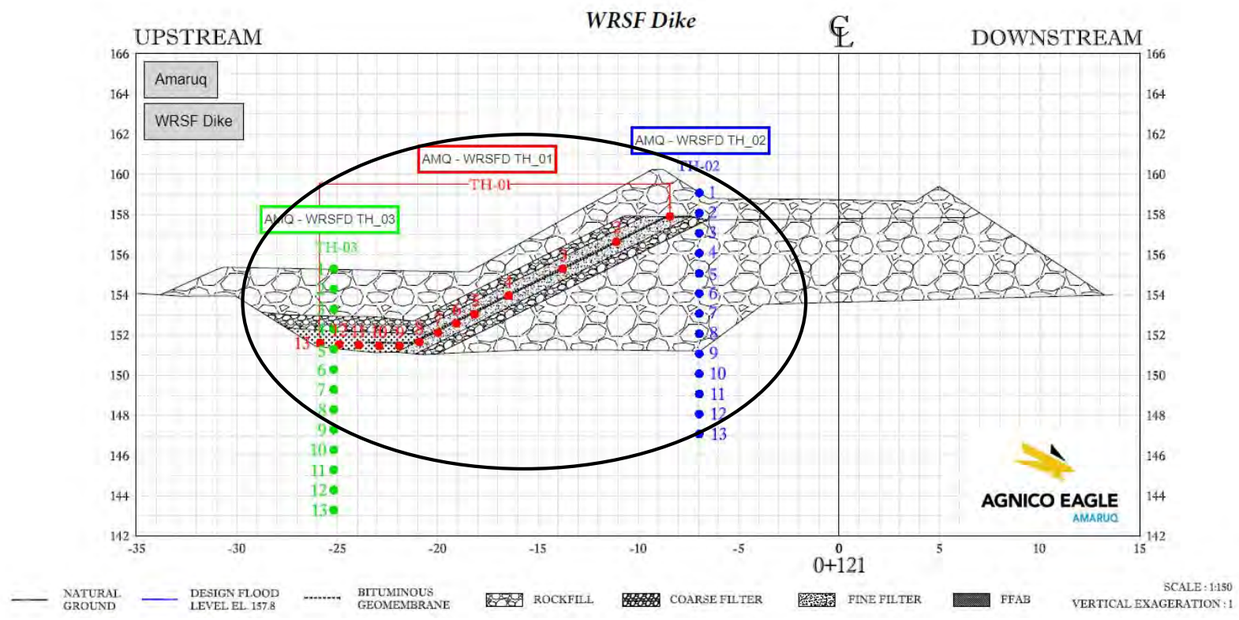

AMQ - DL104 - SAA2: 0+726_Y
CUTOFF WALL
BEDROCK
Elevation(m)
Displacement (mm)
2020-10-01 06:00
2020-09-10 06:00
2020-08-20 06:00
2020-07-30 06:00
2020-07-09 06:00
2020-06-18 06:00
2020-05-28 06:00
2020-05-07 06:00
2020-04-16 06:00
2020-03-26 06:00
2020-03-05 06:00
2020-02-13 06:00
2020-01-23 06:00
2020-01-02 06:00
2019-12-12 06:00
2019-11-21 06:00
2019-10-31 06:00
2019-10-10 06:00
2019-09-19 06:00
2019-08-29 06:00

WRSFD TH 01


WRSFD TH05
WRSFD TH08
WRSFD
WRSFD TH09
WRSFD TH03
WRSFD TH01
WRSFD TH06
WRSFD TH07
WRSF DIKE
WRSFD TH04
WRSFD TH02

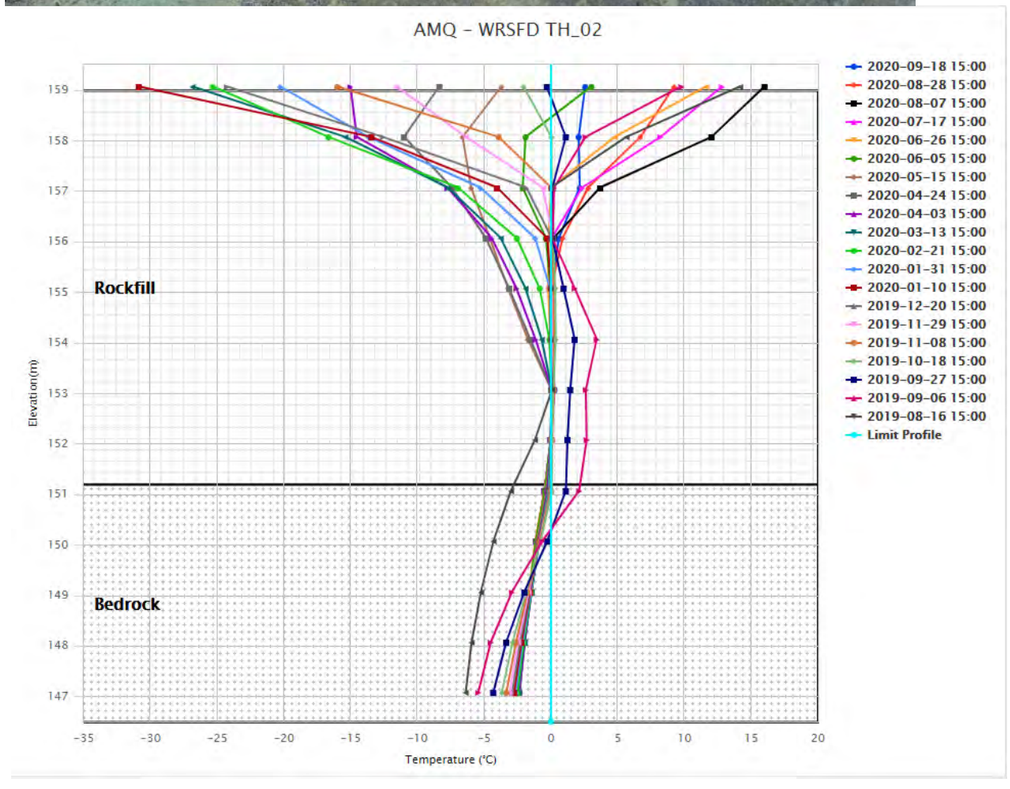

AMQ – WRSFD TH_01
Rockfill
Fine Filter
FFAB
Elevation(m)
Temperature (°C)
2020-09-18 15:00
2020-08-28 15:00
2020-08-07 15:00
2020-07-17 15:00
2020-06-26 15:00
2020-06-05 15:00
2020-05-15 15:00
2020-04-24 15:00
2020-04-03 15:00
2020-03-13 15:00
2020-02-21 15:00
2020-01-31 15:00
2020-01-10 15:00
2019-12-20 15:00
2019-11-29 15:00
2019-11-08 15:00
2019-10-18 15:00
2019-09-27 15:00
2019-09-06 15:00
2019-08-16 15:00
Limit Profile

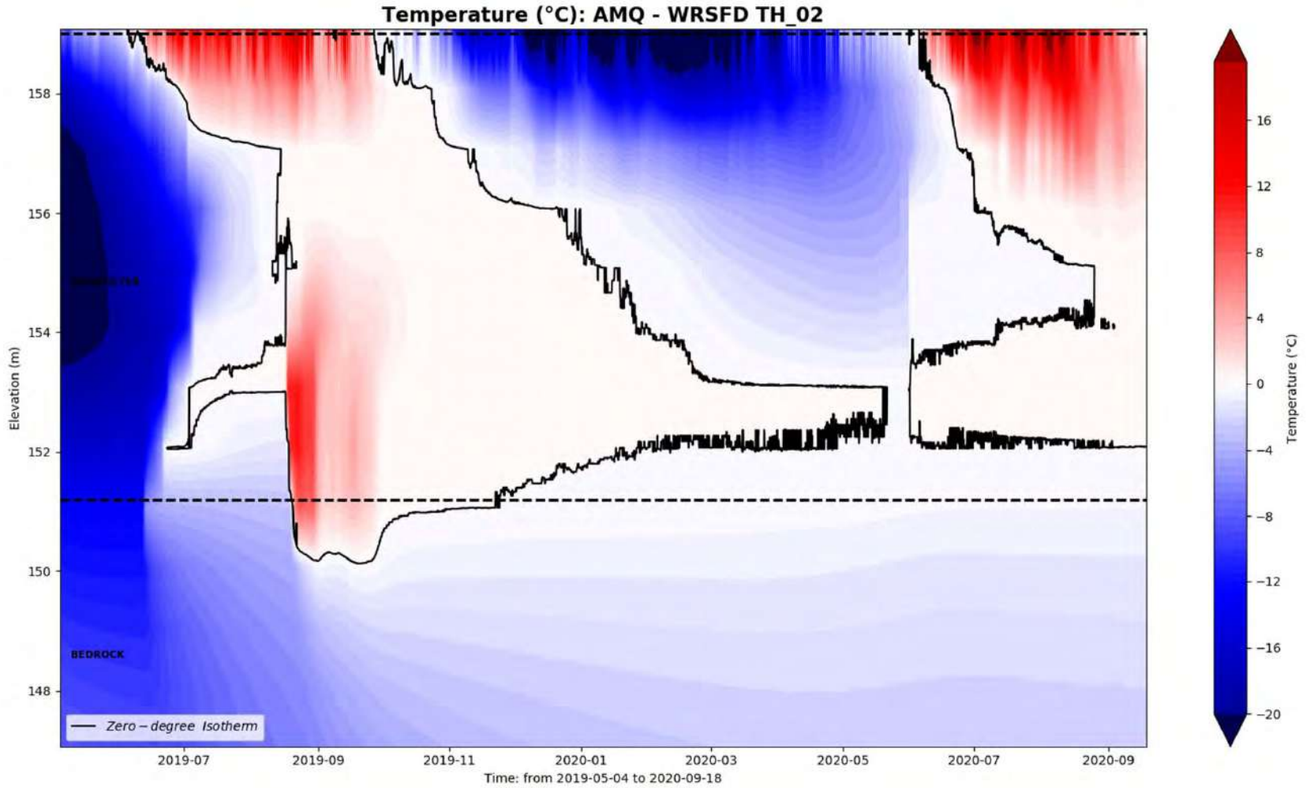

Temperature (°C): AMQ - WRSFD TH_01
Elevation (m)
Zero – degree Isotherm
Time: from 2019-03-19 to 2020-09-18
Temperature (°C)

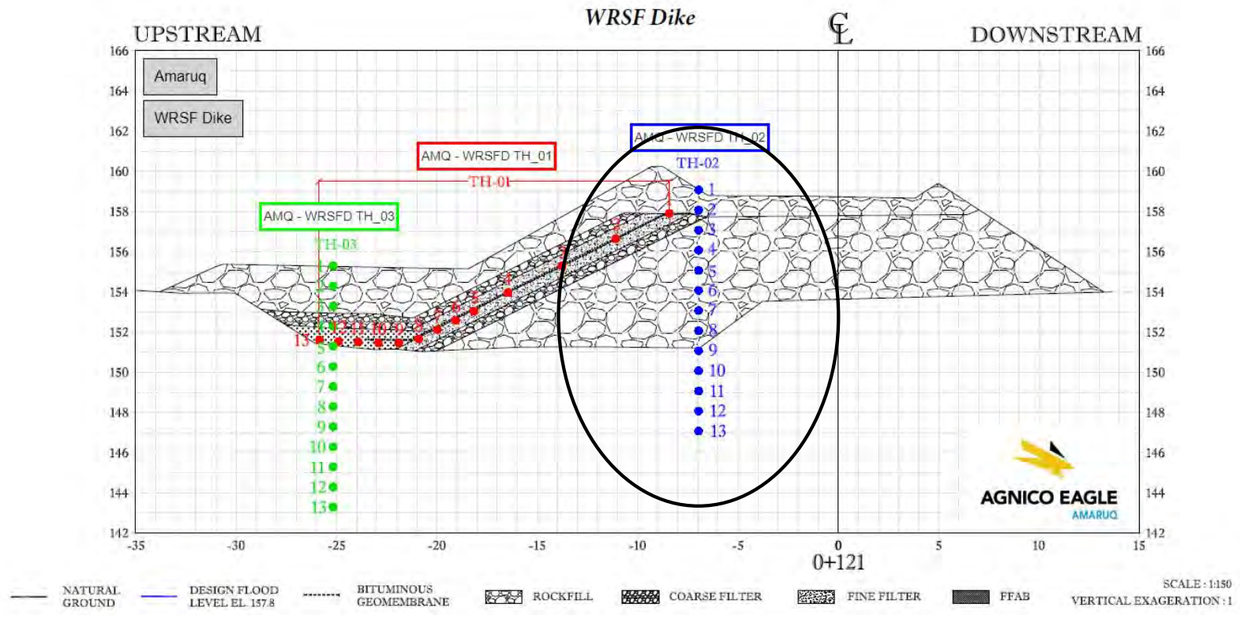

WRSF Dike
UPSTREAM
DOWNSTREAM
Amaruq
WRSF Dike
AMQ - WRSFD TH_01
AMQ - WRSFD TH_02
AMQ - WRSFD TH_03
TH-01
TH-02
TH-03
AGNICO EAGLE
AMARUQ
0+121
NATURAL GROUND
DESIGN FLOOD LEVEL EL. 157.8
BITUMINOUS GEOMEMBRANE
ROCKFILL
COARSE FILTER
FINE FILTER
FFAB
SCALE : 1:150
VERTICAL EXAGERATION : 1

WRSFD TH 02


WRSFD TH05
WRSFD TH08
WRSFD TH03
WRSFD TH09
WRSFD TH01
WRSFD TH06
WRSFD TH07
WRSFD TH04
WRSF DIKE

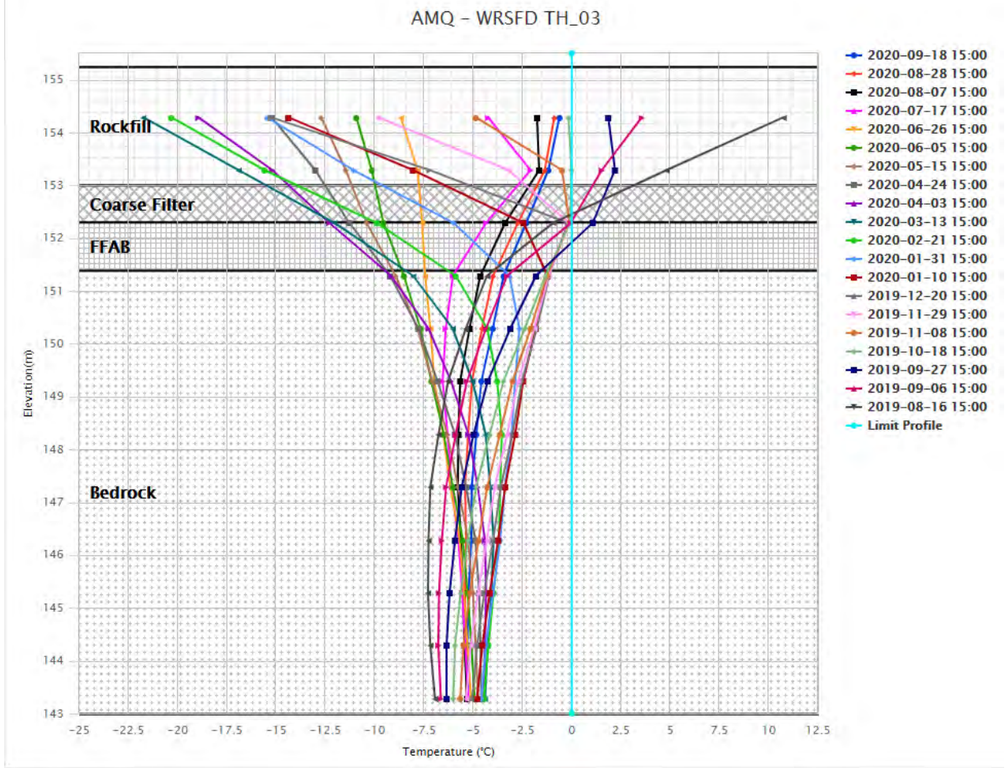

AMQ – WRSFD TH_02
Rockfill
Bedrock
Elevation(m)
Temperature (°C)
2020-09-18 15:00
2020-08-28 15:00
2020-08-07 15:00
2020-07-17 15:00
2020-06-26 15:00
2020-06-05 15:00
2020-05-15 15:00
2020-04-24 15:00
2020-04-03 15:00
2020-03-13 15:00
2020-02-21 15:00
2020-01-31 15:00
2020-01-10 15:00
2019-12-20 15:00
2019-11-29 15:00
2019-11-08 15:00
2019-10-18 15:00
2019-09-27 15:00
2019-09-06 15:00
2019-08-16 15:00
Limit Profile

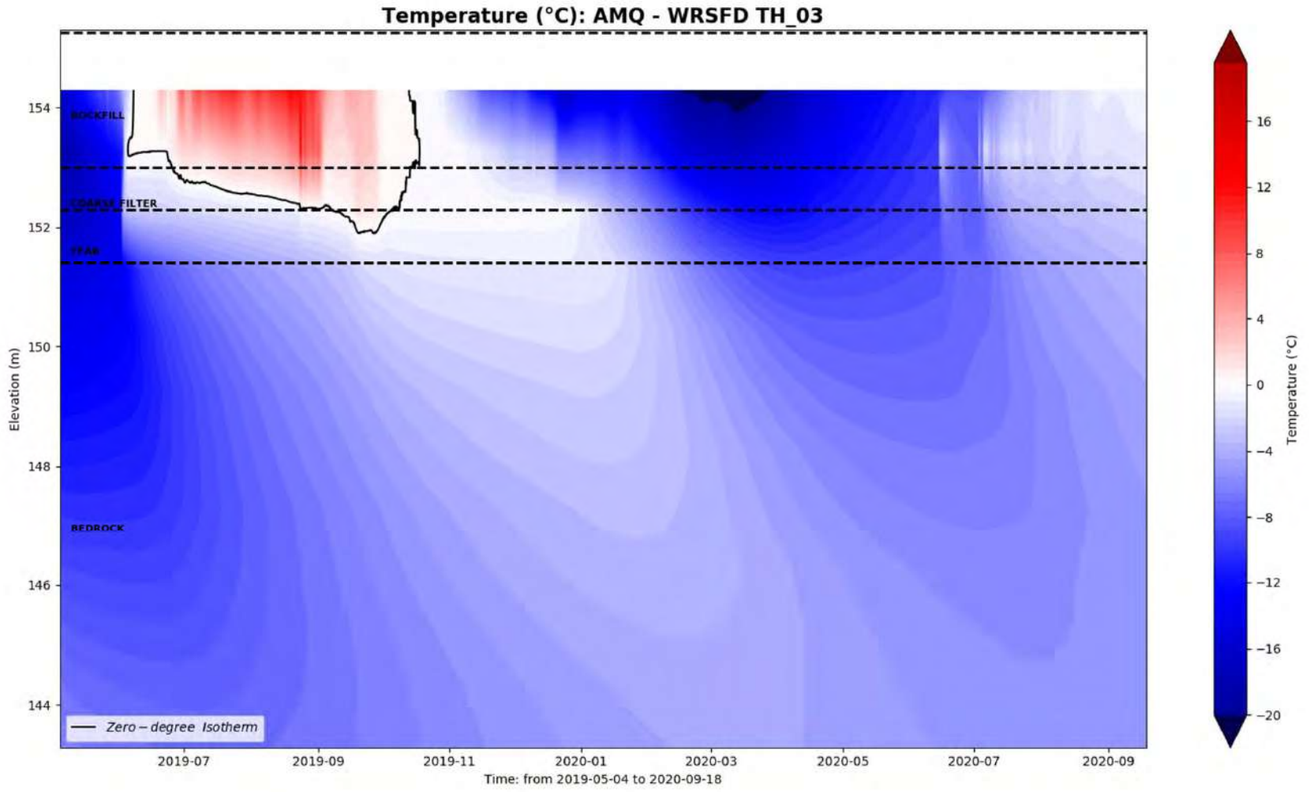

Temperature (°C): AMQ - WRSFD TH_02
Elevation (m)
BEDROCK
Zero – degree Isotherm
Time: from 2019-05-04 to 2020-09-18
Temperature (°C)

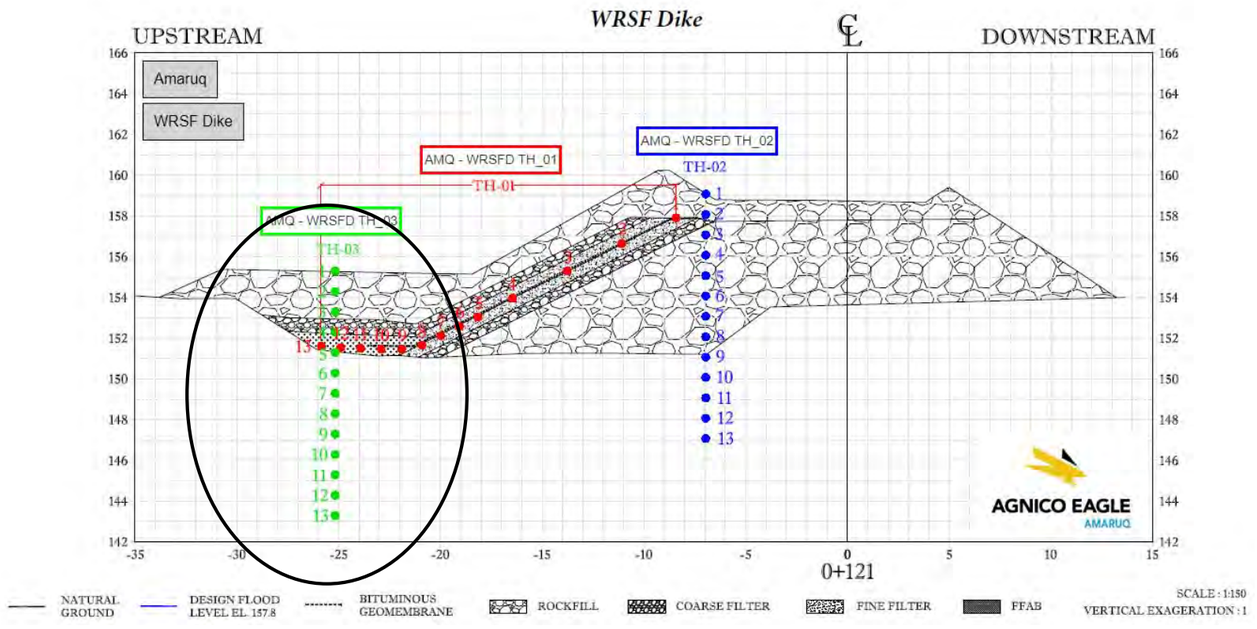

WRSF Dike
UPSTREAM
DOWNSTREAM
Amaruq
WRSF Dike
AMQ - WRSFD TH_01
AMQ - WRSFD TH_02
AMQ - WRSFD TH_03
TH-01
TH-02
TH-03
AGNICO EAGLE
AMARUQ
0+121
NATURAL GROUND
DESIGN FLOOD LEVEL EL. 157.8
BITUMINOUS GEOMEMBRANE
ROCKFILL
COARSE FILTER
FINE FILTER
FFAB
SCALE : 1:150
VERTICAL EXAGERATION : 1

WRSFD TH 03


WRSFD TH05
WRSFD TH08
WRSFD TH03
WRSFD TH09
WRSFD TH01
WRSFD TH06
WRSFD TH07
WRSFD TH04
WRSFD TH02
WRSF DIKE

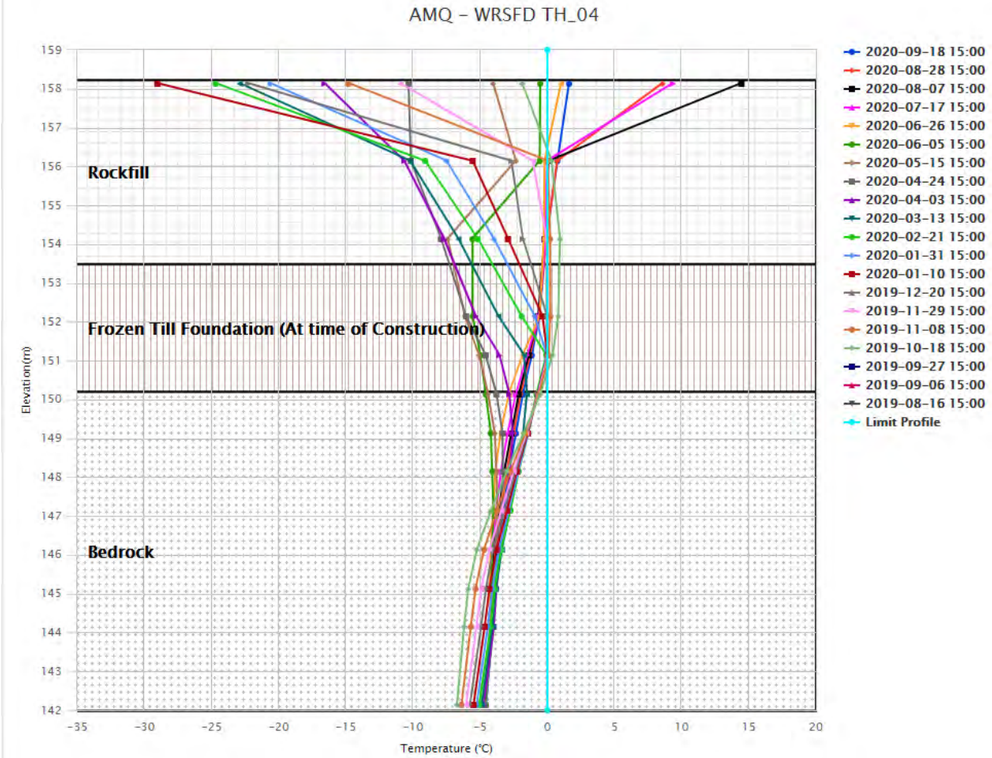

AMQ – WRSFD TH_03
Rockfill
Coarse Filter
FFAB
Bedrock
Elevation (m)
Temperature (°C)
2020-09-18 15:00
2020-08-28 15:00
2020-08-07 15:00
2020-07-17 15:00
2020-06-26 15:00
2020-06-05 15:00
2020-05-15 15:00
2020-04-24 15:00
2020-04-03 15:00
2020-03-13 15:00
2020-02-21 15:00
2020-01-31 15:00
2020-01-10 15:00
2019-12-20 15:00
2019-11-29 15:00
2019-11-08 15:00
2019-10-18 15:00
2019-09-27 15:00
2019-09-06 15:00
2019-08-16 15:00
Limit Profile

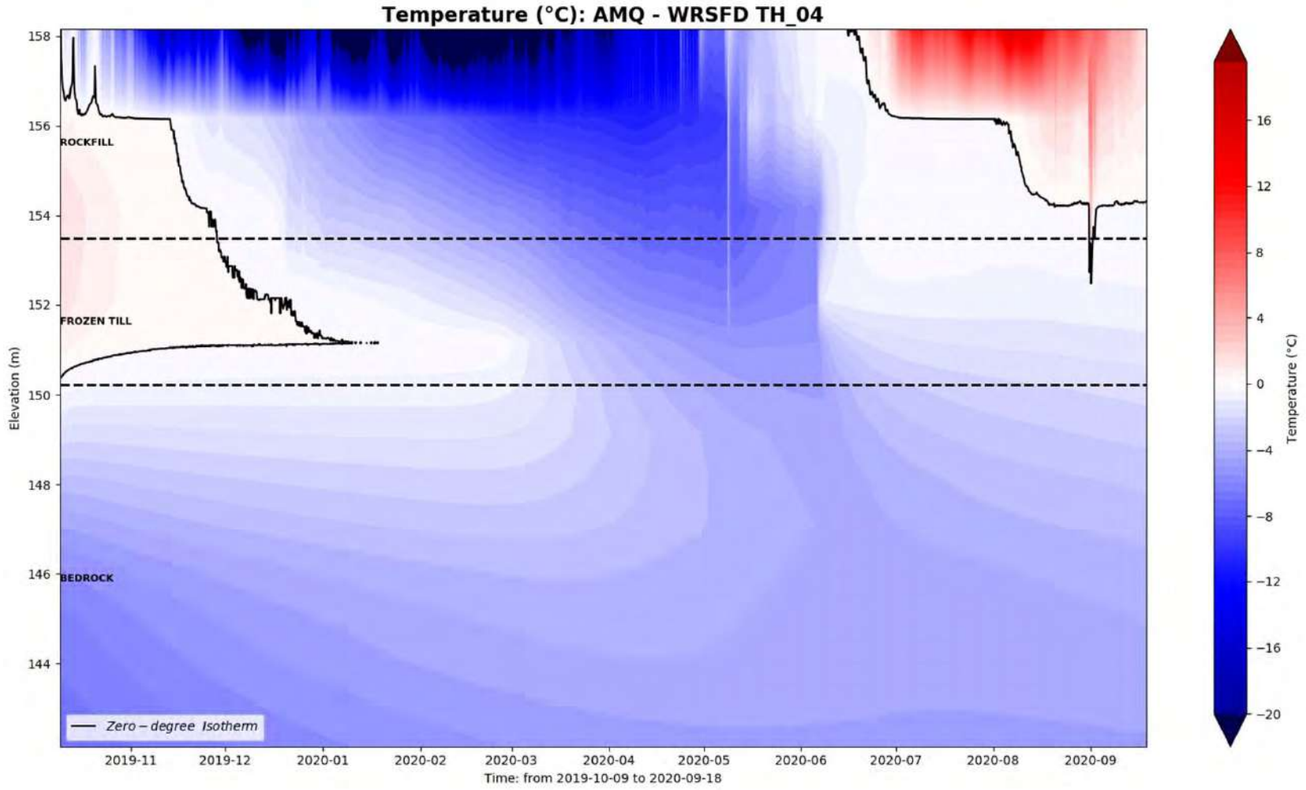

Temperature (°C): AMQ - WRSFD TH_03
ROCKFILL
COARSE FILTER
FFAB
BEDROCK
Zero – degree Isotherm
Elevation (m)
Time: from 2019-05-04 to 2020-09-18
Temperature (°C)

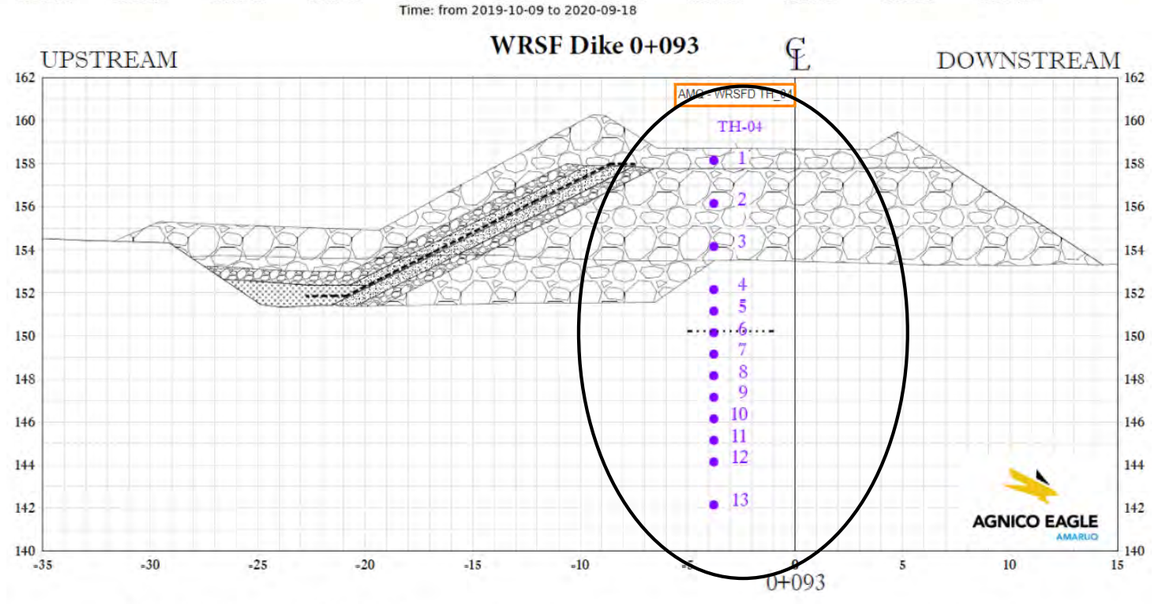

WRSF Dike
UPSTREAM
DOWNSTREAM
Amaruq
WRSF Dike
AMQ - WRSFD TH_01
AMQ - WRSFD TH_02
AMQ - WRSFD TH_03
TH-01
TH-02
TH-03
0+121
AGNICO EAGLE
AMARUQ
NATURAL GROUND
DESIGN FLOOD LEVEL EL. 157.8
BITUMINOUS GEOMEMBRANE
ROCKFILL
COARSE FILTER
FINE FILTER
FFAB
SCALE : 1:150
VERTICAL EXAGERATION : 1

WRSFD TH 04


WRSFD TH05
WRSFD TH08
WRSFD TH03
WRSFD TH09
WRSFD TH01
WRSFD TH06
WRSFD TH07
WRSFD TH04
WRSFD TH02
WRSF DIKE

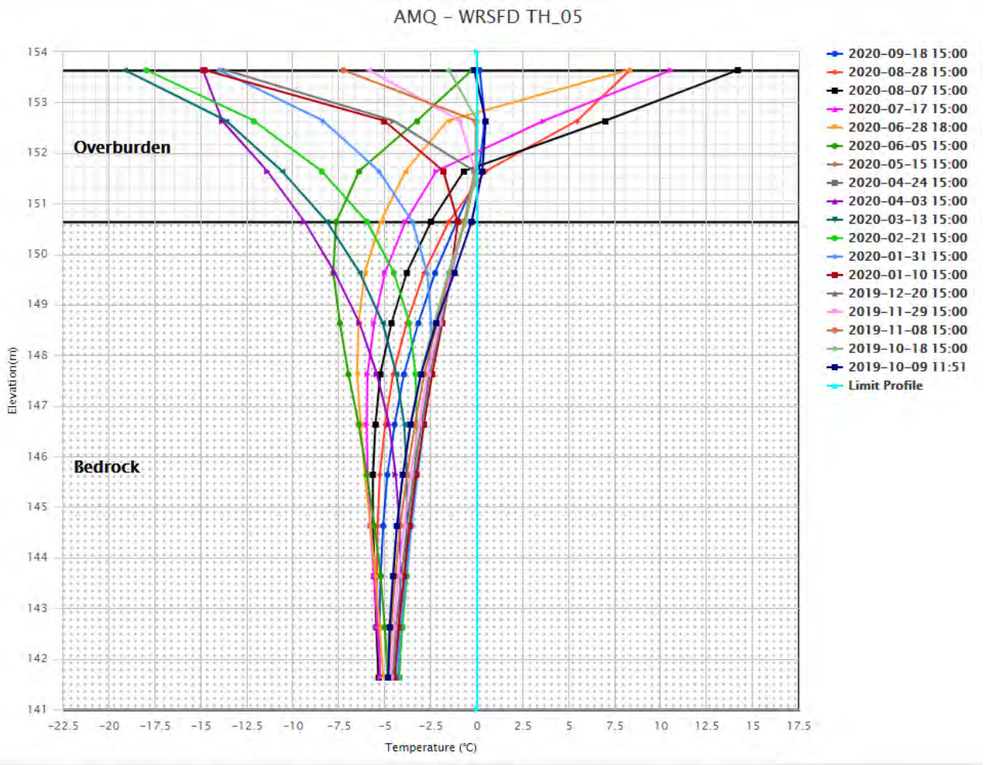

AMQ – WRSFD TH_04
Rockfill
Frozen Till Foundation (At time of Construction)
Bedrock
Elevation (m)
Temperature (°C)
2020-09-18 15:00
2020-08-28 15:00
2020-08-07 15:00
2020-07-17 15:00
2020-06-26 15:00
2020-06-05 15:00
2020-05-15 15:00
2020-04-24 15:00
2020-04-03 15:00
2020-03-13 15:00
2020-02-21 15:00
2020-01-31 15:00
2020-01-10 15:00
2019-12-20 15:00
2019-11-29 15:00
2019-11-08 15:00
2019-10-18 15:00
2019-09-27 15:00
2019-09-06 15:00
2019-08-16 15:00
Limit Profile

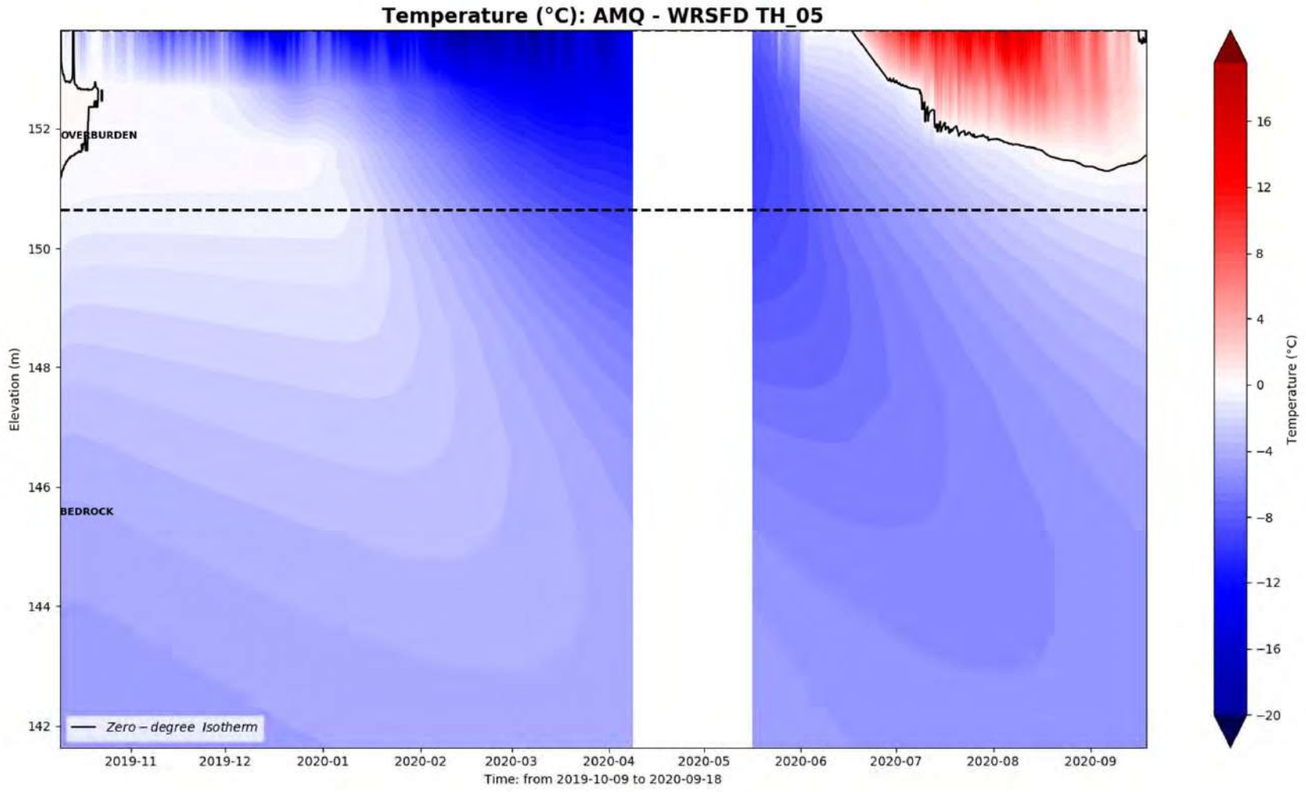

Temperature (°C): AMQ - WRSFD TH_04
ROCKFILL
FROZEN TILL
BEDROCK
Elevation (m)
Zero – degree Isotherm
Time: from 2019-10-09 to 2020-09-18
Temperature (°C)

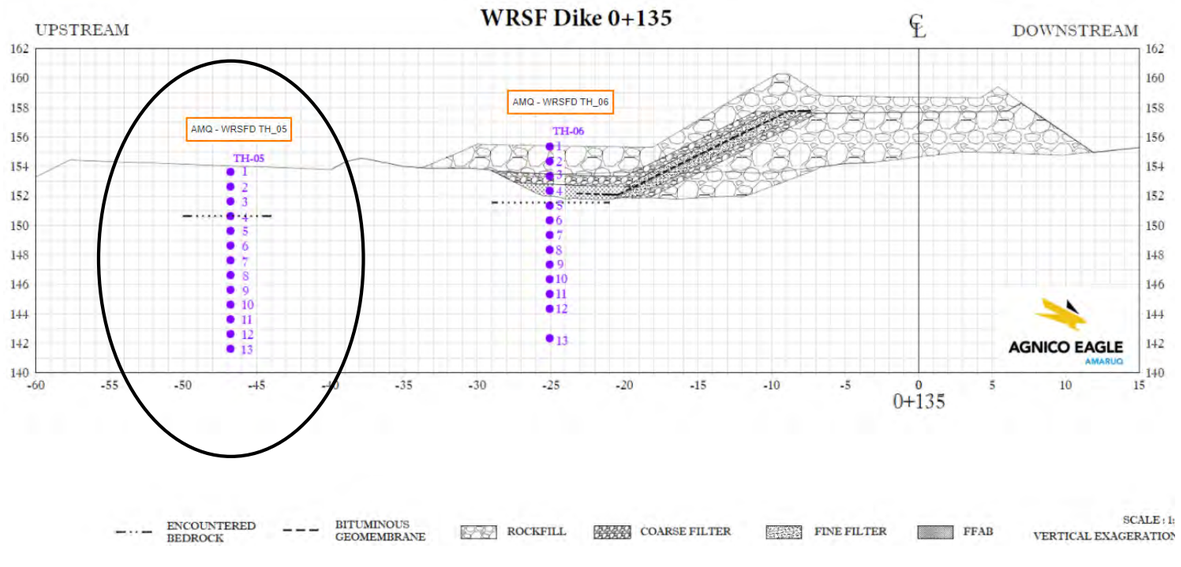

WRSF Dike 0+093
UPSTREAM
DOWNSTREAM
AMQ - WRSFD TH_04
TH-04
0+093
AGNICO EAGLE
AMARUQ
ENCOUNTERED BEDROCK
BITUMINOUS GEOMEMBRANE
ROCKFILL
COARSE FILTER
FINE FILTER
FFAB
VERTICAL

WRSFD TH 05


WRSFD TH05
WRSFD TH08
WRSFD TH03
WRSFD TH09
WRSFD TH01
WRSFD TH06
WRSFD TH07
WRSFD TH04
WRSFD TH02
WRSF DIKE

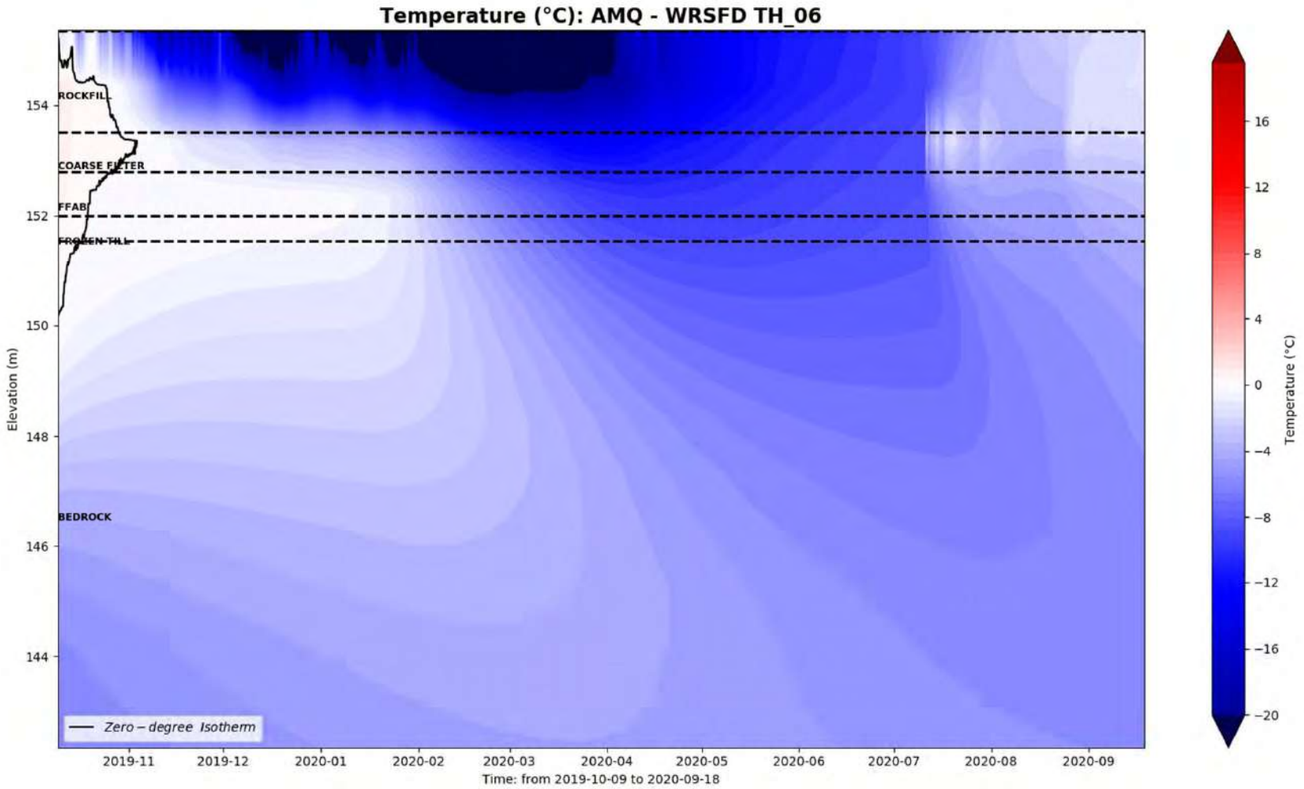

AMQ – WRSFD TH_05
Overburden
Bedrock
Elevation(m)
Temperature (°C)
2020-09-18 15:00
2020-08-28 15:00
2020-08-07 15:00
2020-07-17 15:00
2020-06-28 18:00
2020-06-05 15:00
2020-05-15 15:00
2020-04-24 15:00
2020-04-03 15:00
2020-03-13 15:00
2020-02-21 15:00
2020-01-31 15:00
2020-01-10 15:00
2019-12-20 15:00
2019-11-29 15:00
2019-11-08 15:00
2019-10-18 15:00
2019-10-09 11:51
Limit Profile

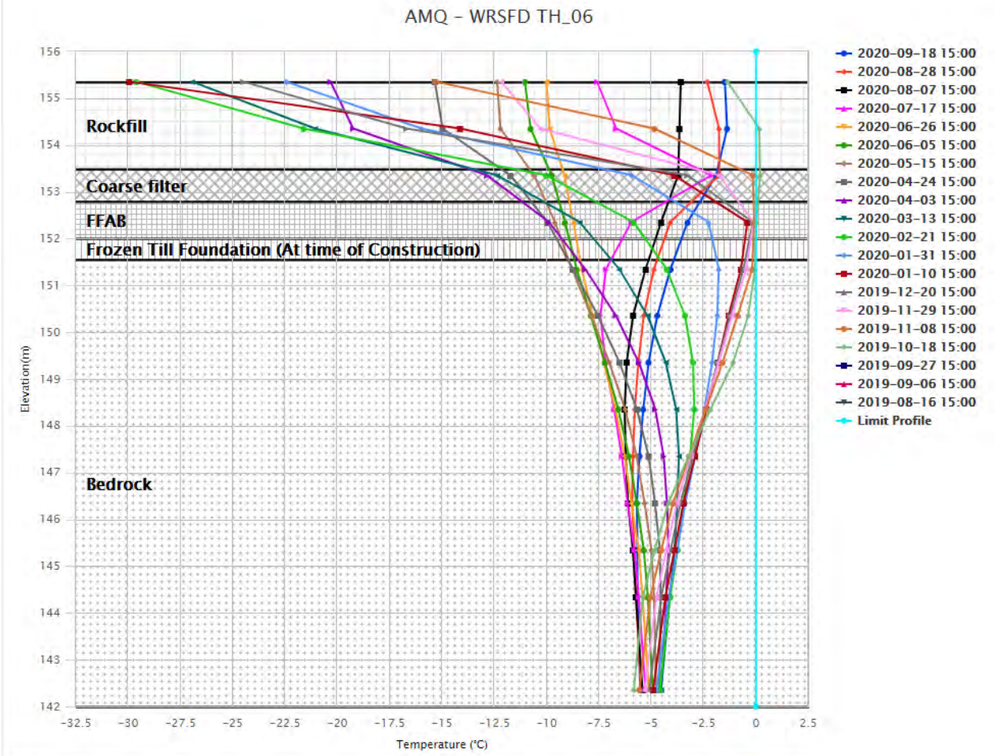

Temperature (°C): AMQ - WRSFD TH_05
OVERBURDEN
BEDROCK
Elevation (m)
Zero – degree Isotherm
Time: from 2019-10-09 to 2020-09-18
Temperature (°C)

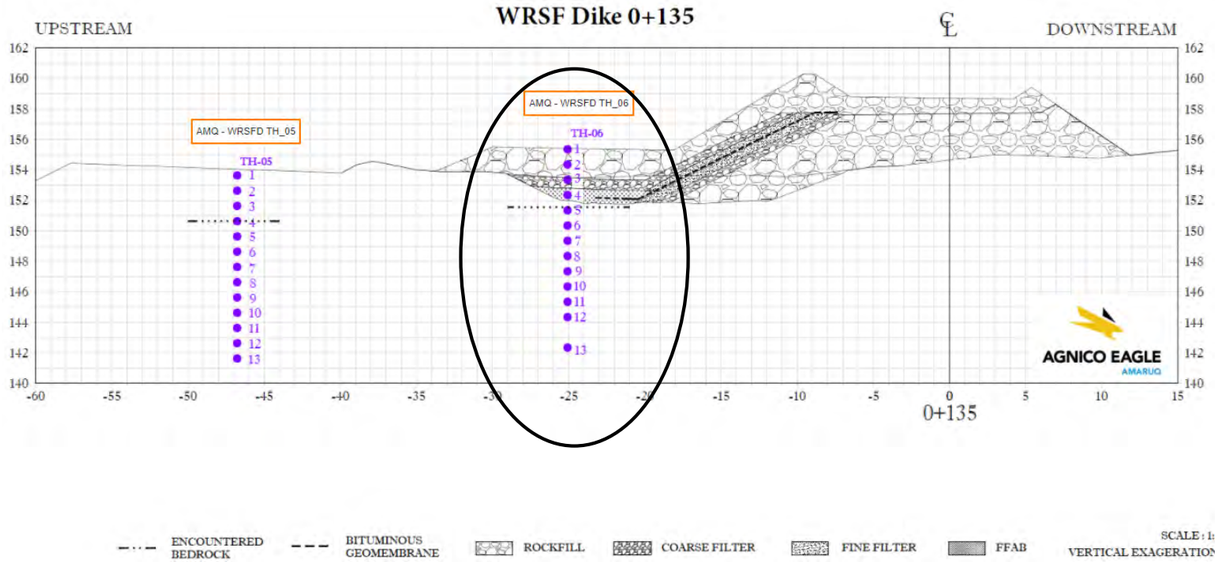

WRSF Dike 0+135
UPSTREAM
DOWNSTREAM
AMQ - WRSFD TH_05
AMQ - WRSFD TH_06
TH-05
TH-06
0+135
AGNICO EAGLE
AMARUQ
ENCOUNTERED BEDROCK
BITUMINOUS GEOMEMBRANE
ROCKFILL
COARSE FILTER
FINE FILTER
FFAB
VERTICAL EXAGERATION

WRSFD TH 06


WRSFD TH05
WRSFD TH08
WRSFD TH03
WRSFD TH01
WRSFD TH06
WRSFD TH07
WRSFD TH04
WRSFD TH02
WRSF DIKE


Temperature (°C): AMQ - WRSFD TH_06
ROCKFIL
COARSE FILTER
FFAB
FROZEN TILL
BEDROCK
Zero – degree Isotherm
Elevation (m)
Time: from 2019-10-09 to 2020-09-18
Temperature (°C)

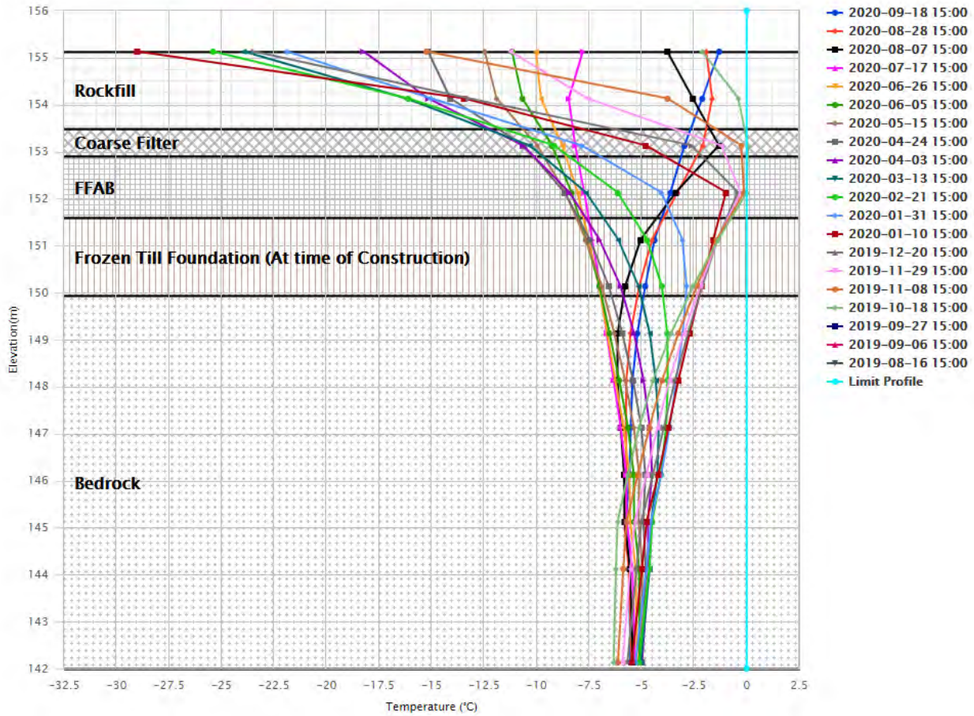

AMQ – WRSFD TH_06
Rockfill
Coarse filter
FFAB
Frozen Till Foundation (At time of Construction)
Bedrock
Elevation(m)
Temperature (°C)
2020–09–18 15:00
2020–08–28 15:00
2020–08–07 15:00
2020–07–17 15:00
2020–06–26 15:00
2020–06–05 15:00
2020–05–15 15:00
2020–04–24 15:00
2020–04–03 15:00
2020–03–13 15:00
2020–02–21 15:00
2020–01–31 15:00
2020–01–10 15:00
2019–12–20 15:00
2019–11–29 15:00
2019–11–08 15:00
2019–10–18 15:00
2019–09–27 15:00
2019–09–06 15:00
2019–08–16 15:00
Limit Profile

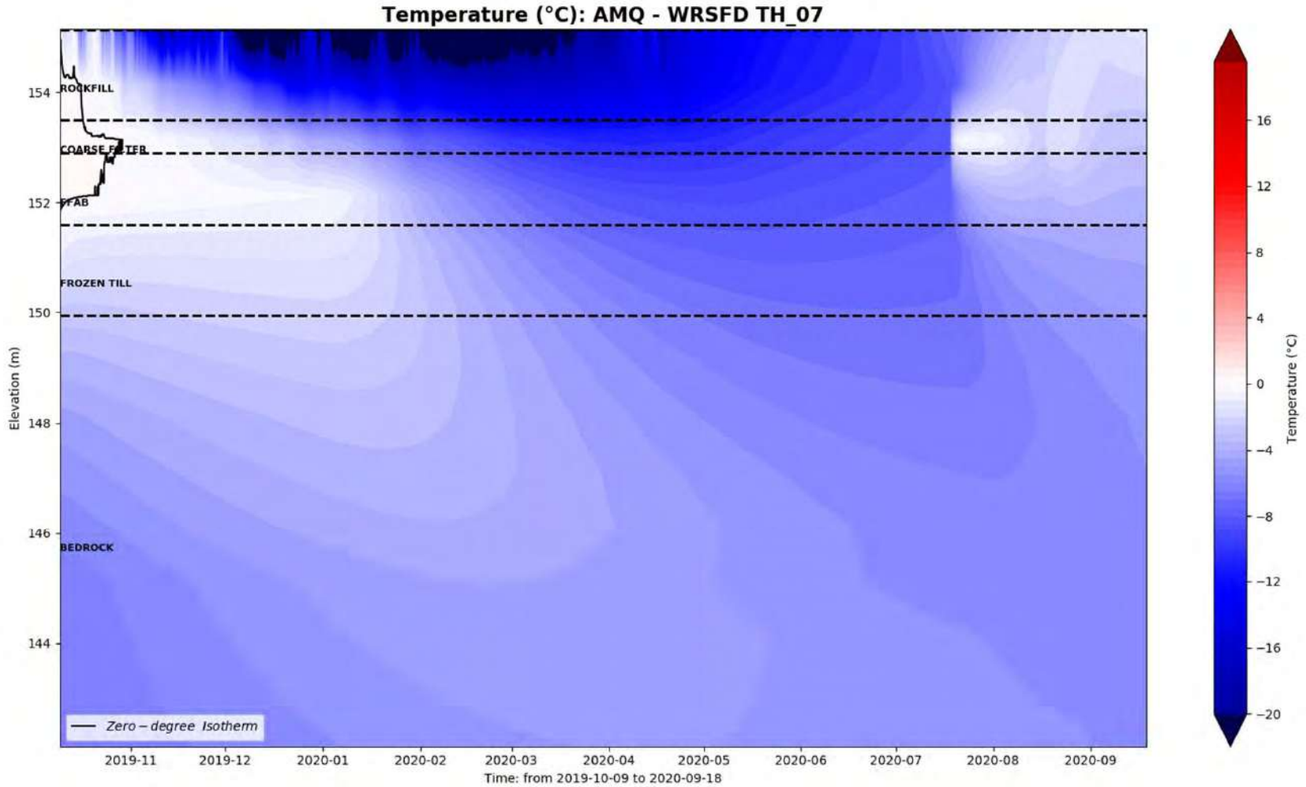

WRSF Dike 0+135
UPSTREAM
DOWNSTREAM
AMQ - WRSFD TH_05
AMQ - WRSFD TH_06
TH-05
TH-06
AGNICO EAGLE
AMARUQ
0+135
ENCOUNTERED BEDROCK
BITUMINOUS GEOMEMBRANE
ROCKFILL
COARSE FILTER
FINE FILTER
FFAB

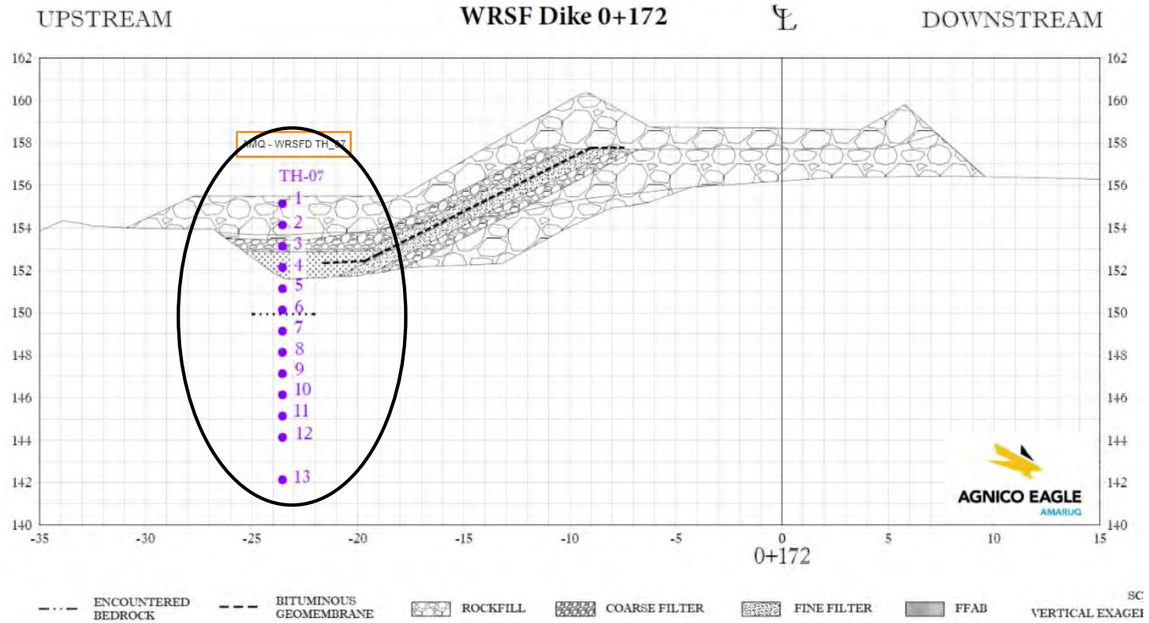
WRSFD TH 07



AMQ – WRSFD TH_07

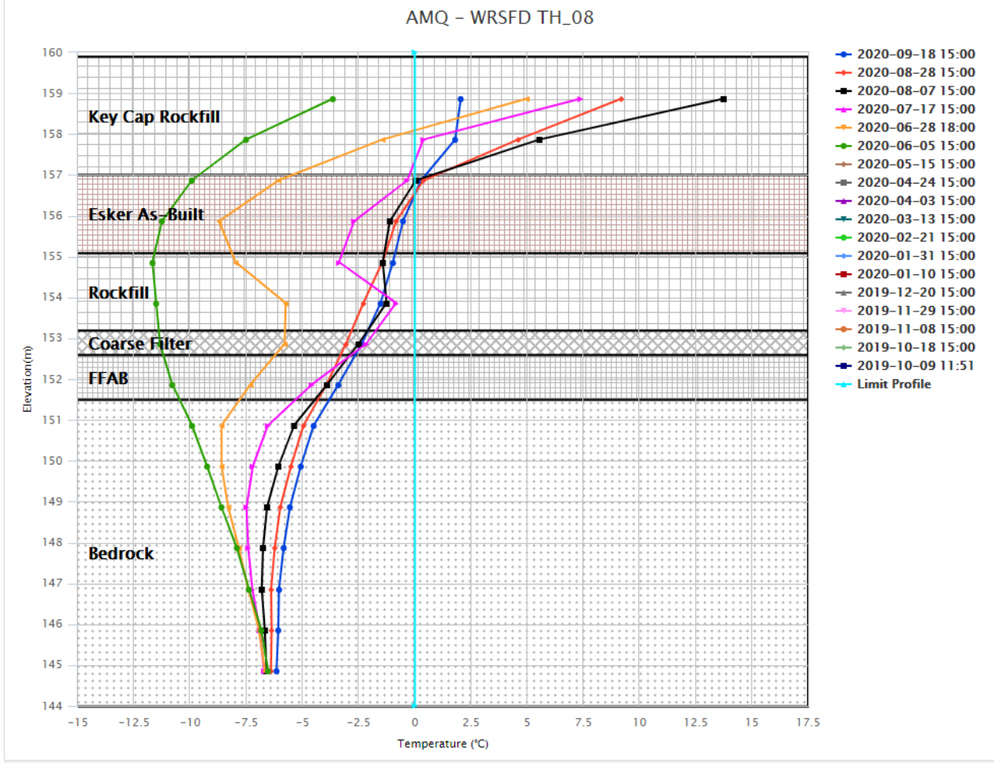


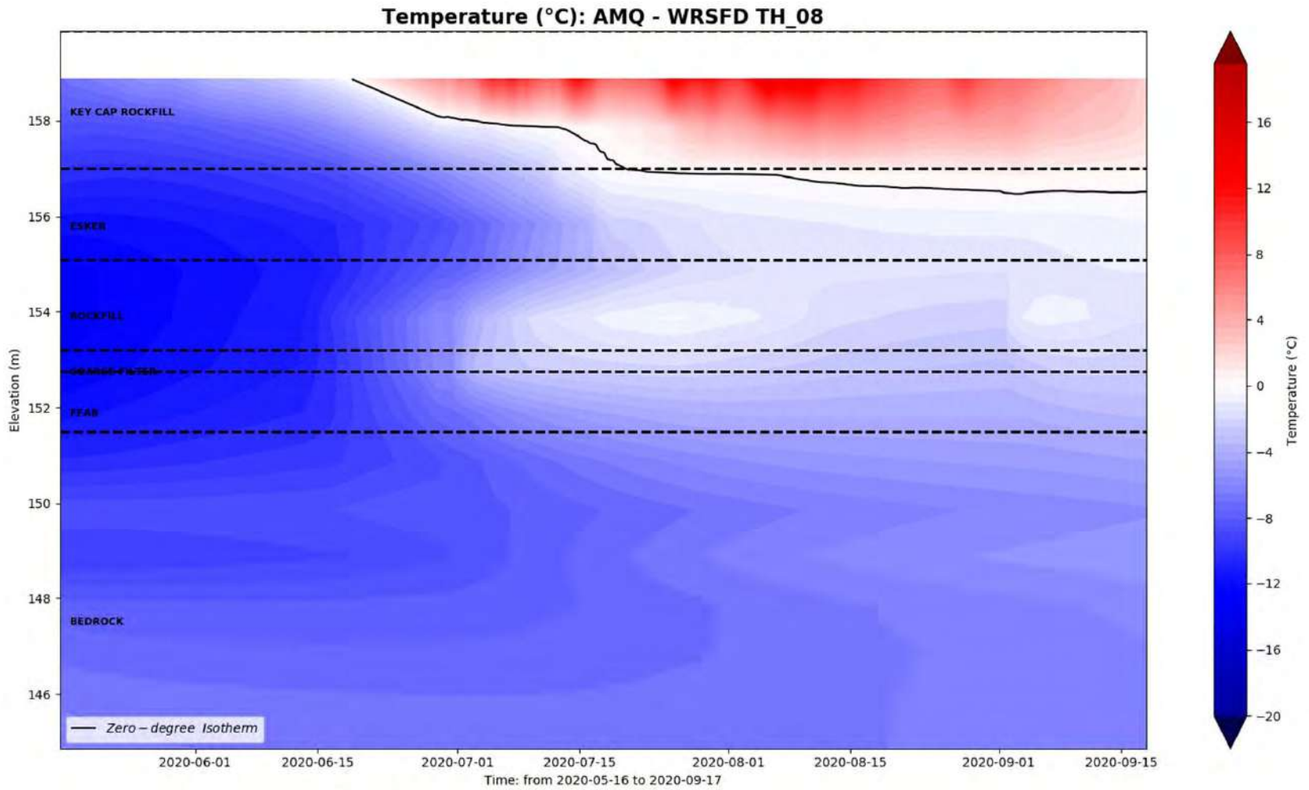


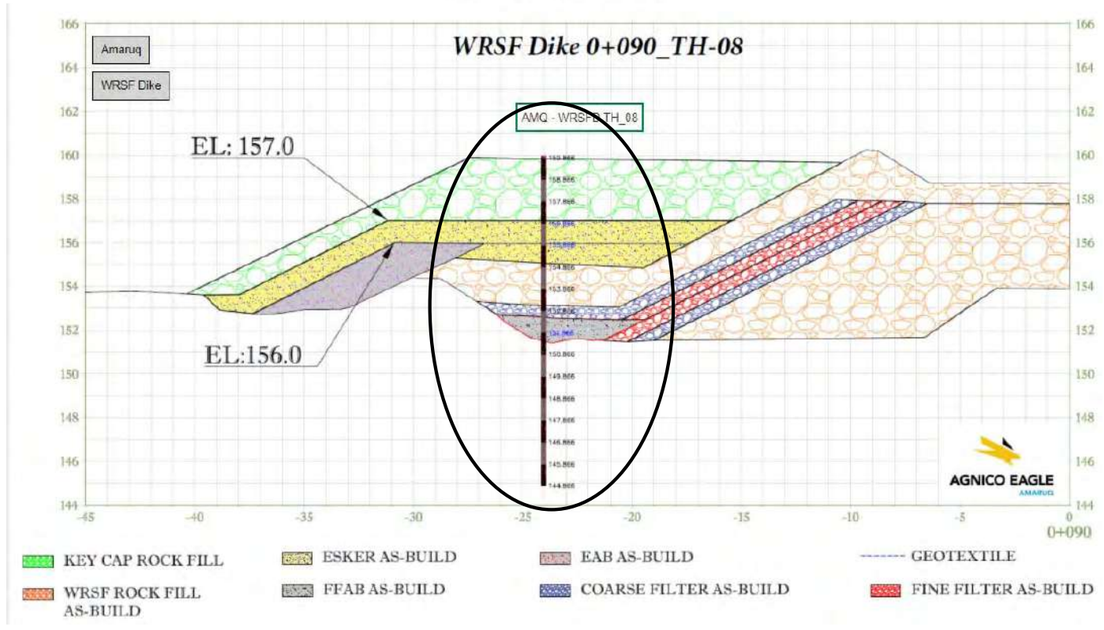


WRSFD TH 08


WRSFD TH08
WRSFD TH05
WRSFD TH03
WRSFD TH09
WRSFD TH01
WRSFD TH06
WRSFD TH07
WRSFD TH04
WRSFD TH02
WRSF DIKE


AMQ – WRSFD TH_08
Key Cap Rockfill
Esker As-Built
Rockfill
Coarse Filter
FFAB
Bedrock
Elevation (m)
Temperature (°C)
2020-09-18 15:00
2020-08-28 15:00
2020-08-07 15:00
2020-07-17 15:00
2020-06-28 18:00
2020-06-05 15:00
2020-05-15 15:00
2020-04-24 15:00
2020-04-03 15:00
2020-03-13 15:00
2020-02-21 15:00
2020-01-31 15:00
2020-01-10 15:00
2019-12-20 15:00
2019-11-29 15:00
2019-11-08 15:00
2019-10-18 15:00
2019-10-09 11:51
Limit Profile

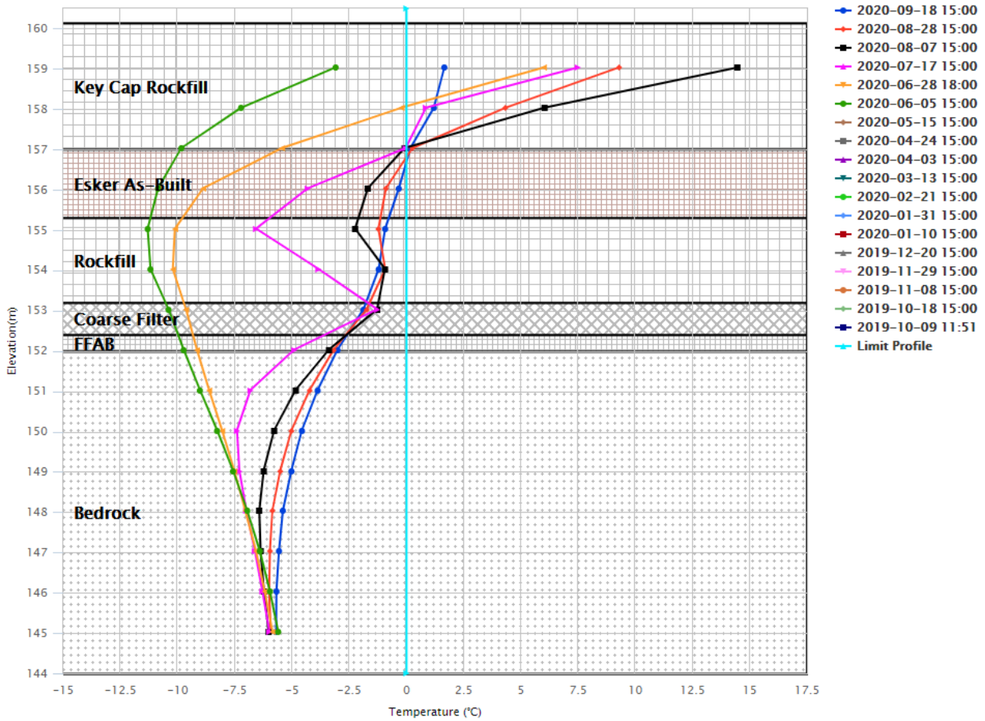

Temperature (°C): AMQ - WRSFD TH_08
KEY CAP ROCKFILL
ESKER
ROCKFILL
FFAB
BEDROCK
Zero – degree Isotherm
Elevation (m)
Time: from 2020-05-16 to 2020-09-17
Temperature (°C)

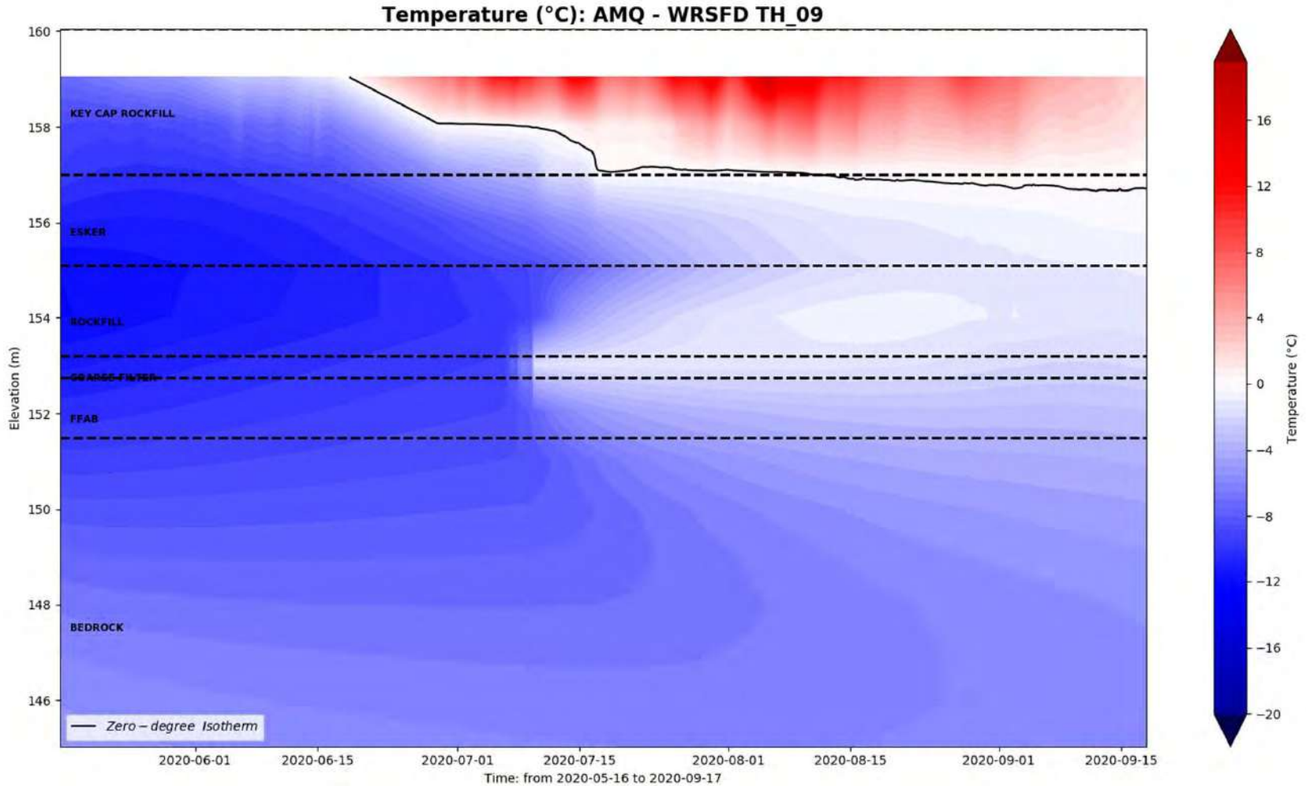

Amaruq
WRSF Dike
WRSF Dike 0+090_TH-08
AMQ - WRSFD TH_08
EL: 157.0
EL:156.0
AGNICO EAGLE
0+090
KEY CAP ROCK FILL
WRSF ROCK FILL AS-BUILD
ESKER AS-BUILD
FFAB AS-BUILD
EAB AS-BUILD
COARSE FILTER AS-BUILD
GEOTEXTILE
FINE FILTER AS-BUILD

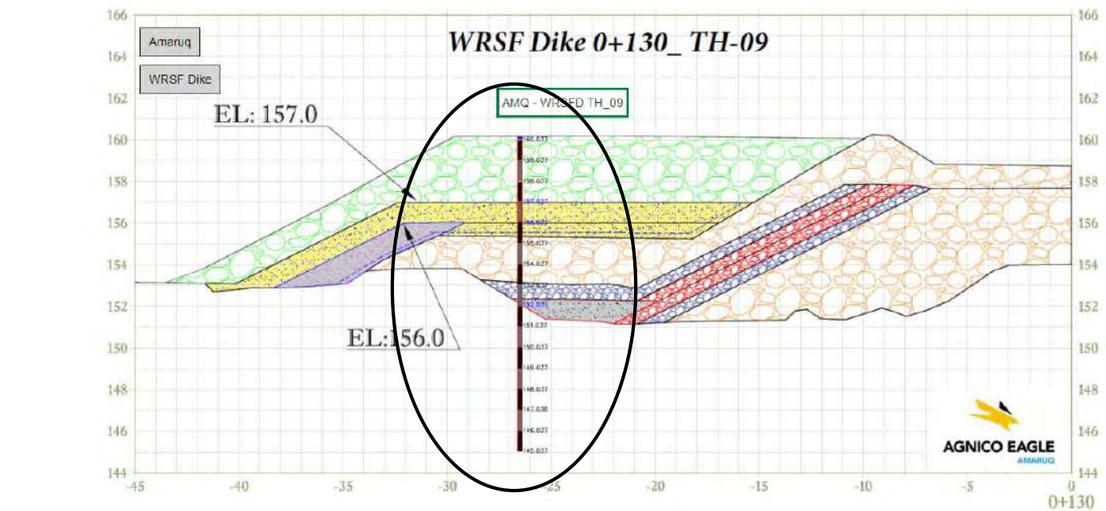
WRSFD TH 09



AMQ – WRSFD TH_09





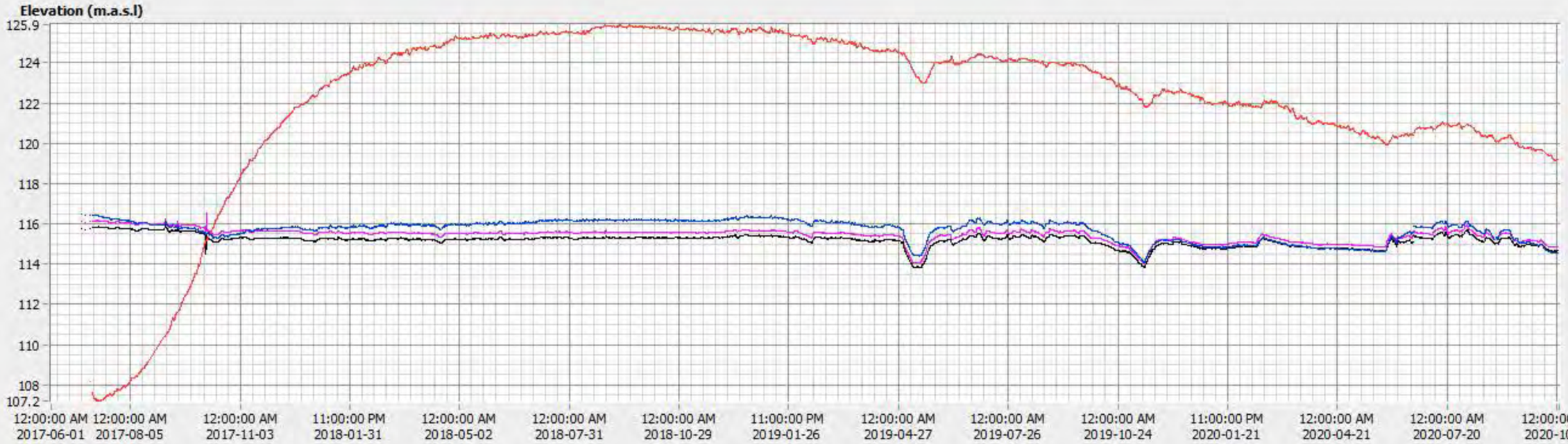


KEY CAP ROCK FILL
ESKER AS-BUILD
EAB AS-BUILD
GEOTEXTILE
WRSF ROCK FILL AS-BUILD
COARSE FILTER
FFAB AS-BUILD
FINE FILTER AS-BUILD

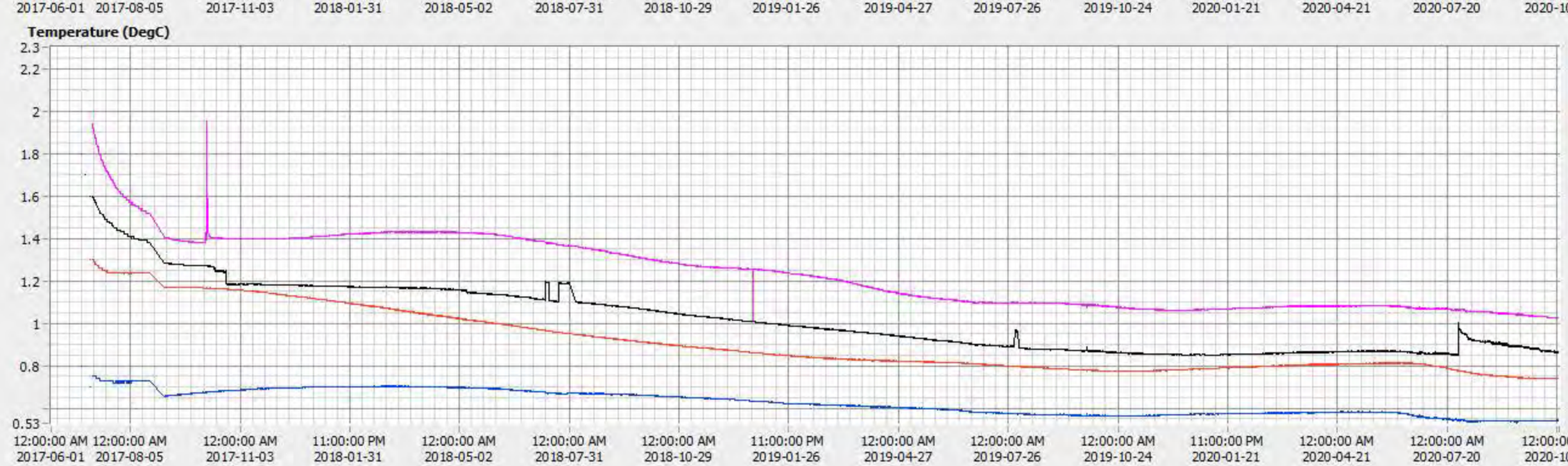
12 - Central Dike: 700_P1

1 month

0 0



Plot	Latest
700_P1_A_masl: DL11_650_Sys_Pz	114.5
700_P1_B_masl: DL11_650_Sys_Pz	119.2
700_P1_C_masl: DL11_650_Sys_Pz	114.6
700_P1_D_masl: DL11_650_Sys_Pz	114.8

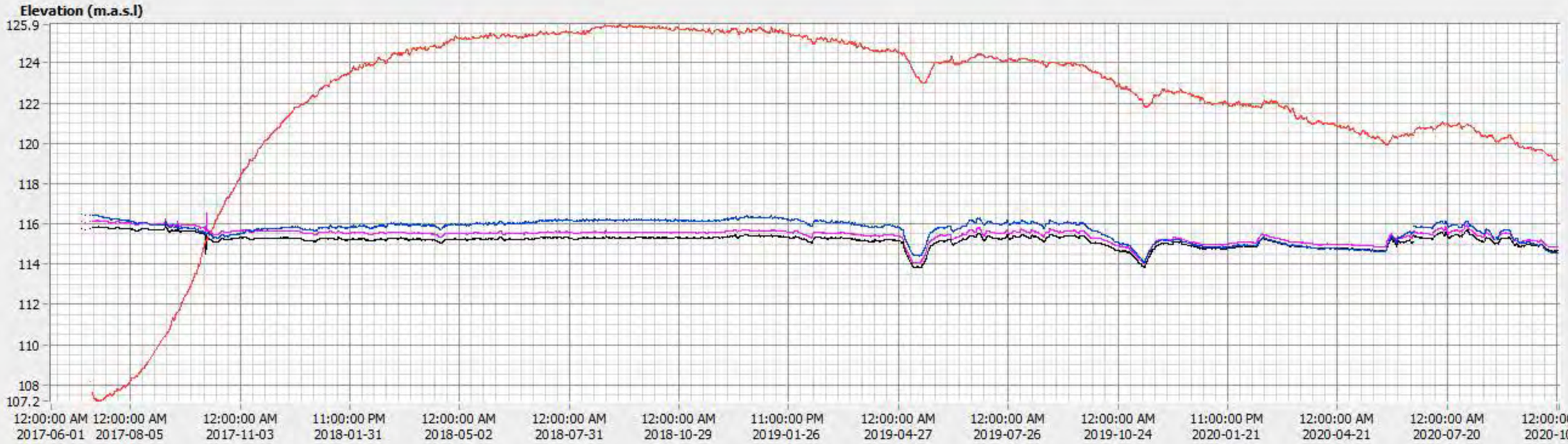


Plot	Latest
PZ_700_P1_A_T: DL11_650_Sys_Pz	0.546
PZ_700_P1_B_T: DL11_650_Sys_Pz	0.743
PZ_700_P1_C_T: DL11_650_Sys_Pz	0.863
PZ_700_P1_D_T: DL11_650_Sys_Pz	1.027

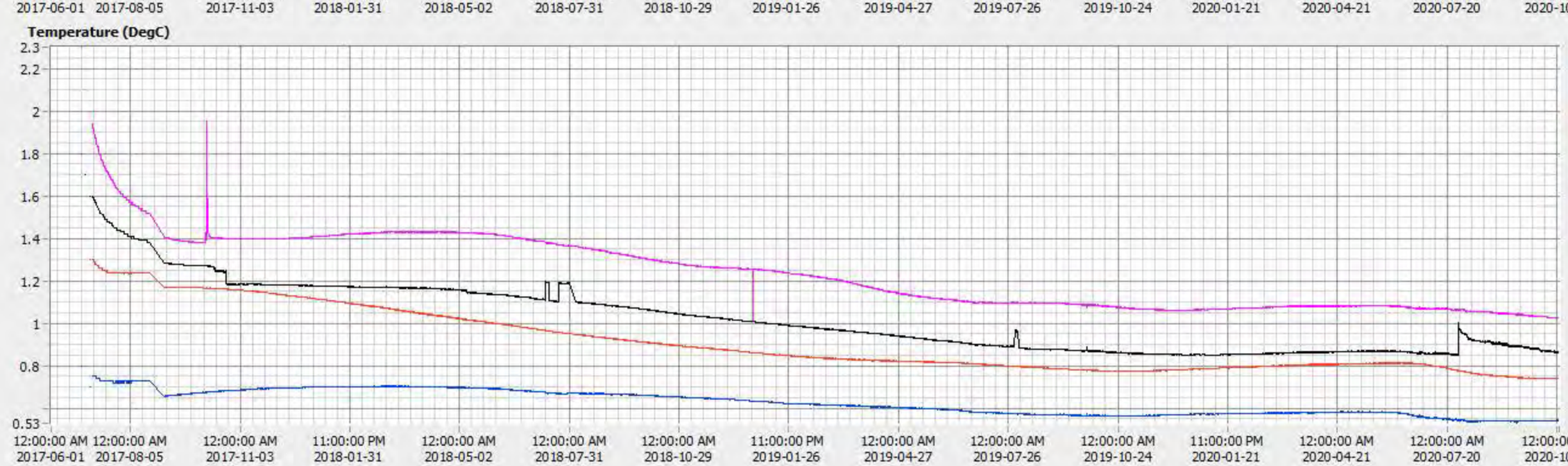
12 - Central Dike: 700_P1

1 month

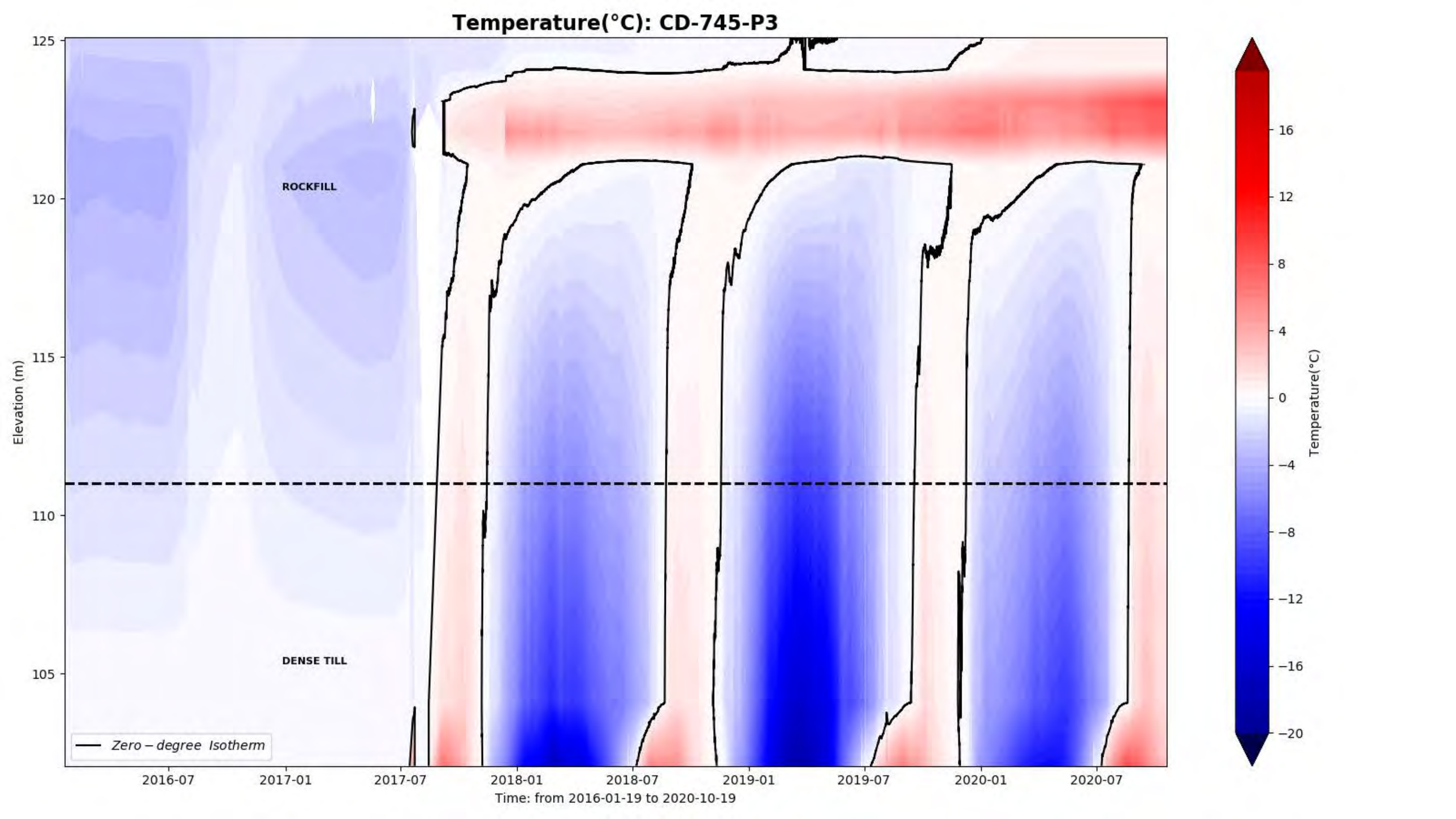
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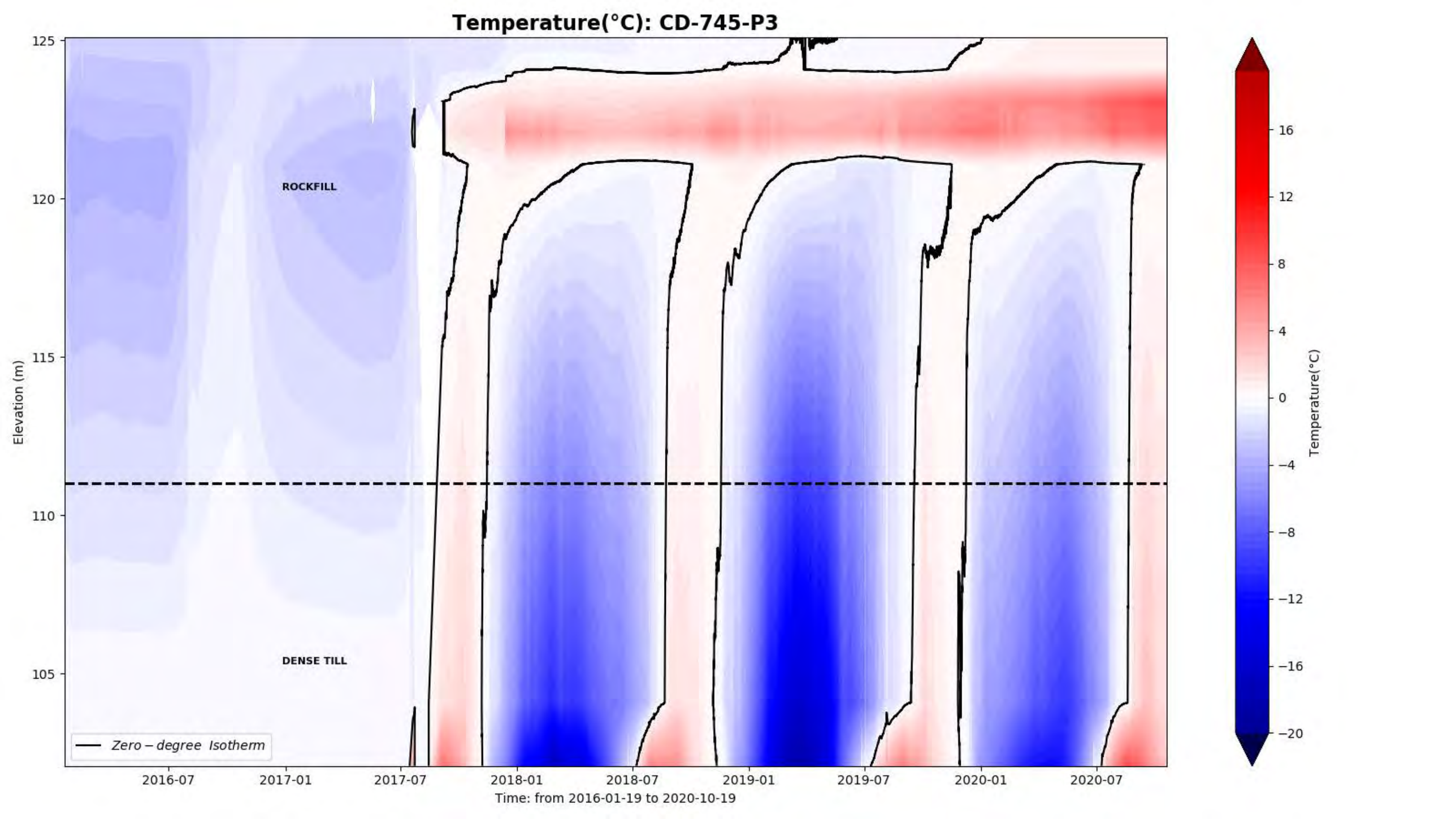


Plot	Latest
700_P1_A_masl: DL11_650_Sys_Pz	114.5
700_P1_B_masl: DL11_650_Sys_Pz	119.2
700_P1_C_masl: DL11_650_Sys_Pz	114.6
700_P1_D_masl: DL11_650_Sys_Pz	114.8

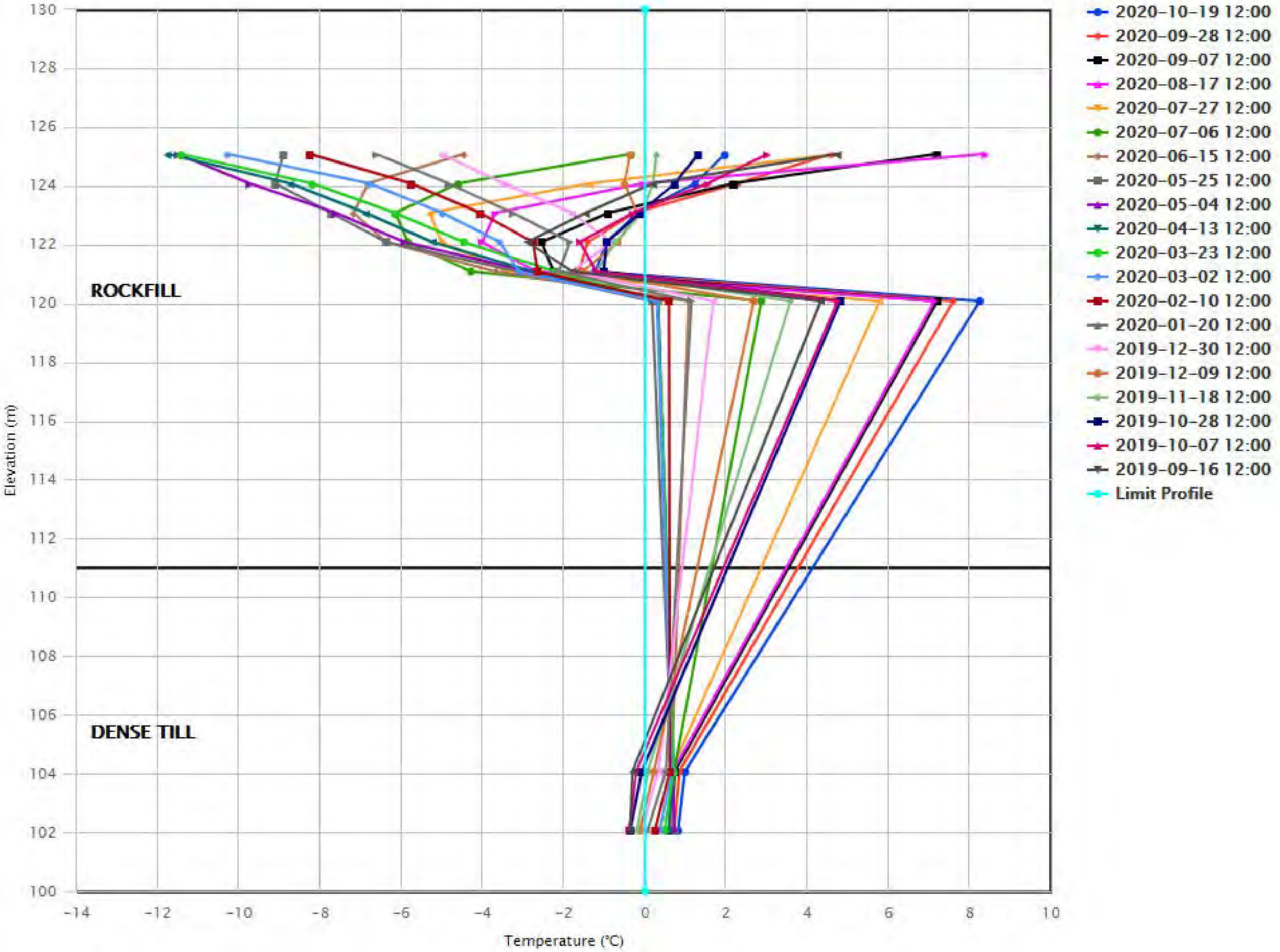


Plot	Latest
PZ_700_P1_A_T: DL11_650_Sys_Pz	0.546
PZ_700_P1_B_T: DL11_650_Sys_Pz	0.743
PZ_700_P1_C_T: DL11_650_Sys_Pz	0.863
PZ_700_P1_D_T: DL11_650_Sys_Pz	1.027

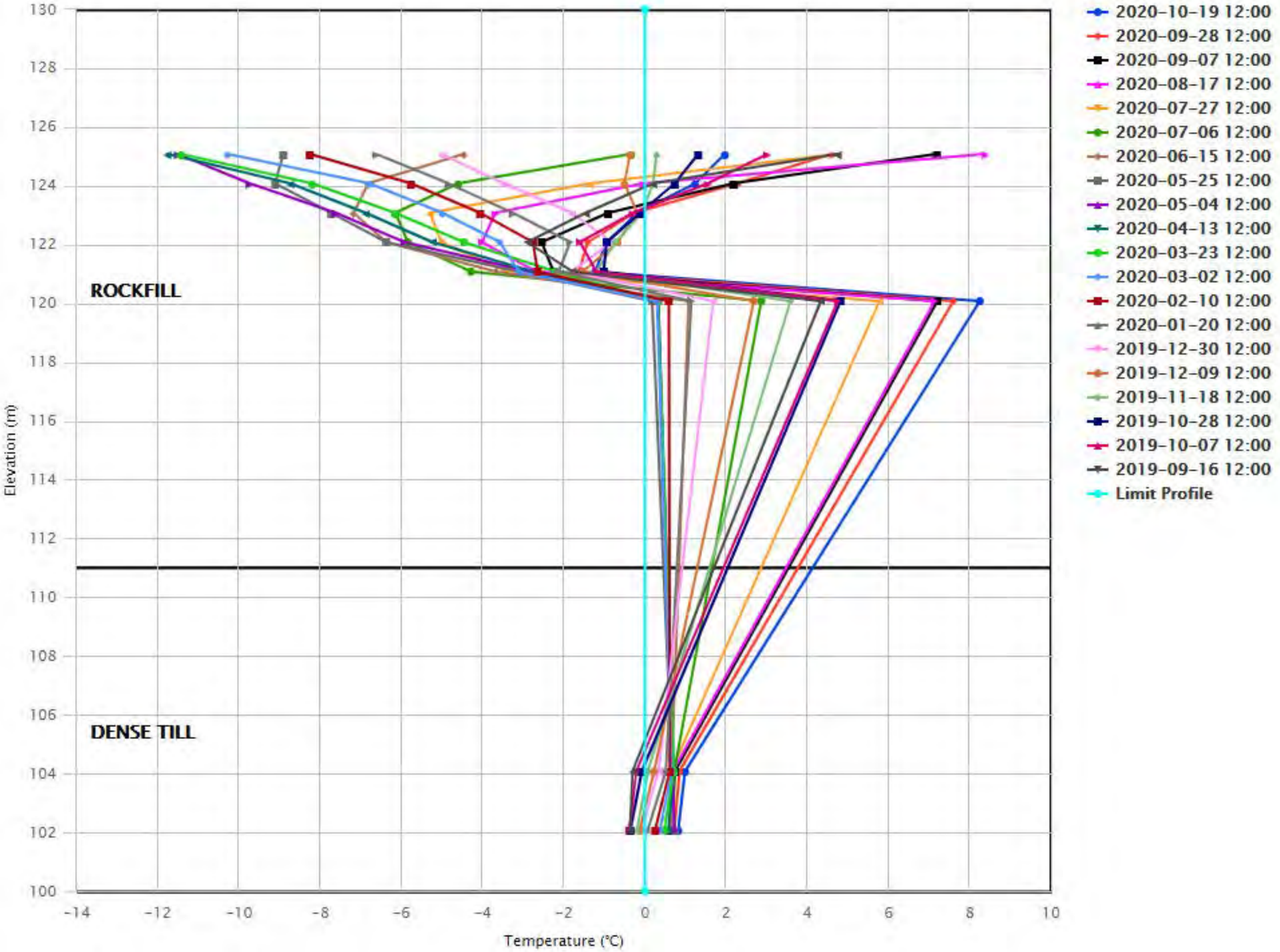

Temperature(°C): CD-745-P3
ROCKFILL
DENSE TILL
Zero – degree Isotherm
Elevation (m)
125
120
115
110
105
2016-07
2017-01
2017-07
2018-01
2018-07
2019-01
2019-07
2020-01
2020-07
Time: from 2016-01-19 to 2020-10-19
16
12
8
4
0
−4
−8
−12
−16
−20
Temperature(°C)


Temperature(°C): CD-745-P3
ROCKFILL
DENSE TILL
Zero – degree Isotherm
Elevation (m)
125
120
115
110
105
2016-07
2017-01
2017-07
2018-01
2018-07
2019-01
2019-07
2020-01
2020-07
Time: from 2016-01-19 to 2020-10-19
16
12
8
4
0
−4
−8
−12
−16
−20
Temperature(°C)

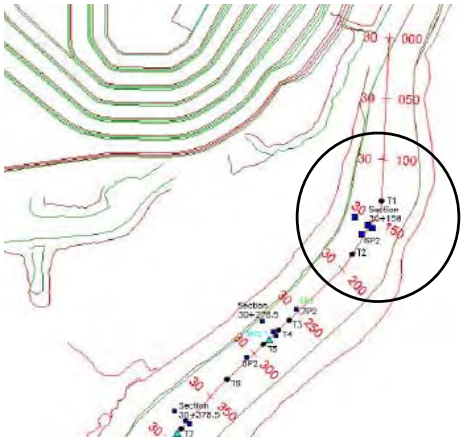
12 – CD – 745 – P3

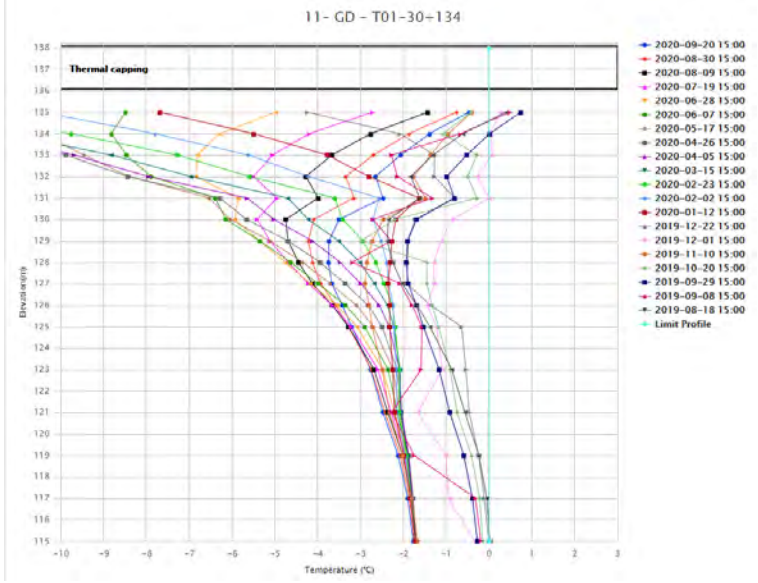

ROCKFILL
DENSE TILL
Elevation (m)
130
128
126
124
122
120
118
116
114
112
110
108
106
104
102
100
-14
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
Temperature (°C)
2020-10-19 12:00
2020-09-28 12:00
2020-09-07 12:00
2020-08-17 12:00
2020-07-27 12:00
2020-07-06 12:00
2020-06-15 12:00
2020-05-25 12:00
2020-05-04 12:00
2020-04-13 12:00
2020-03-23 12:00
2020-03-02 12:00
2020-02-10 12:00
2020-01-20 12:00
2019-12-30 12:00
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2019-11-18 12:00
2019-10-28 12:00
2019-10-07 12:00
2019-09-16 12:00
Limit Profile

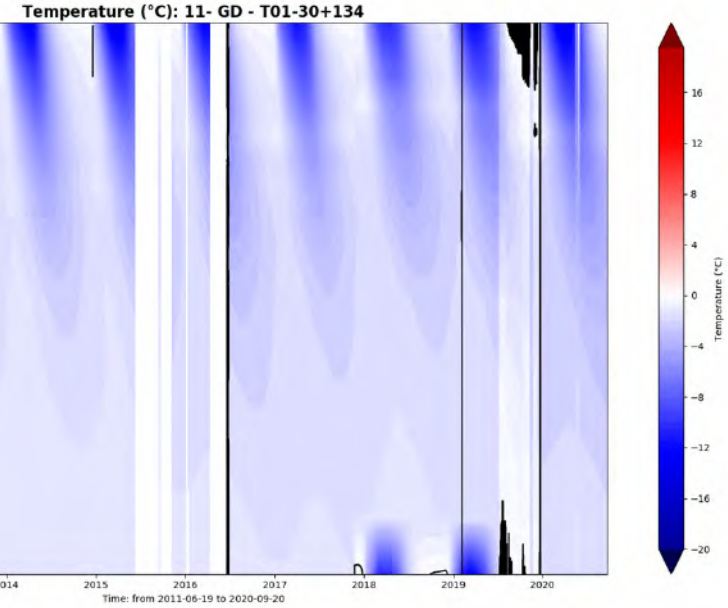
12 – CD – 745 – P3

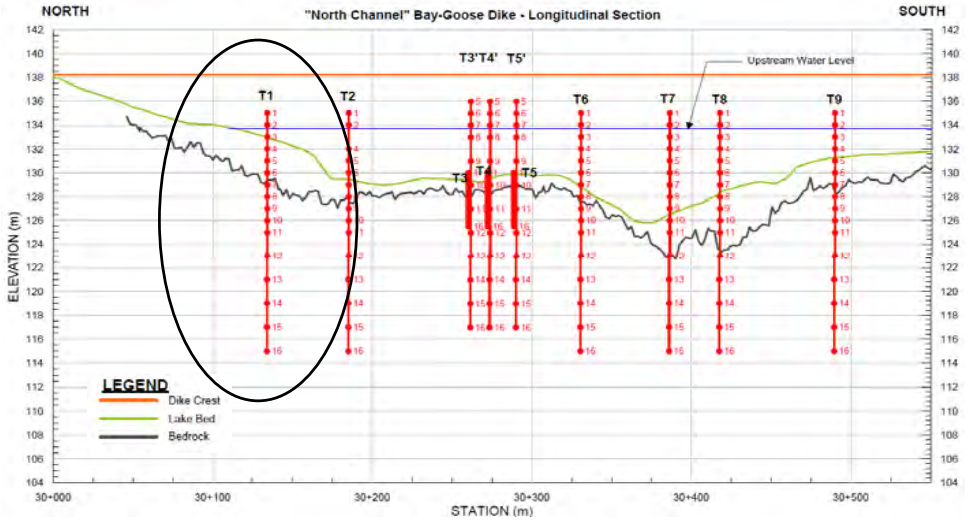

ROCKFILL
DENSE TILL
Elevation (m)
130
128
126
124
122
120
118
116
114
112
110
108
106
104
102
100
-14
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
Temperature (°C)
2020-10-19 12:00
2020-09-28 12:00
2020-09-07 12:00
2020-08-17 12:00
2020-07-27 12:00
2020-07-06 12:00
2020-06-15 12:00
2020-05-25 12:00
2020-05-04 12:00
2020-04-13 12:00
2020-03-23 12:00
2020-03-02 12:00
2020-02-10 12:00
2020-01-20 12:00
2019-12-30 12:00
2019-12-09 12:00
2019-11-18 12:00
2019-10-28 12:00
2019-10-07 12:00
2019-09-16 12:00
Limit Profile

Bay Goose Dike TH01

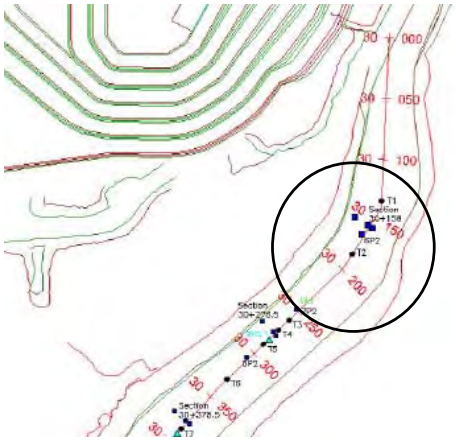


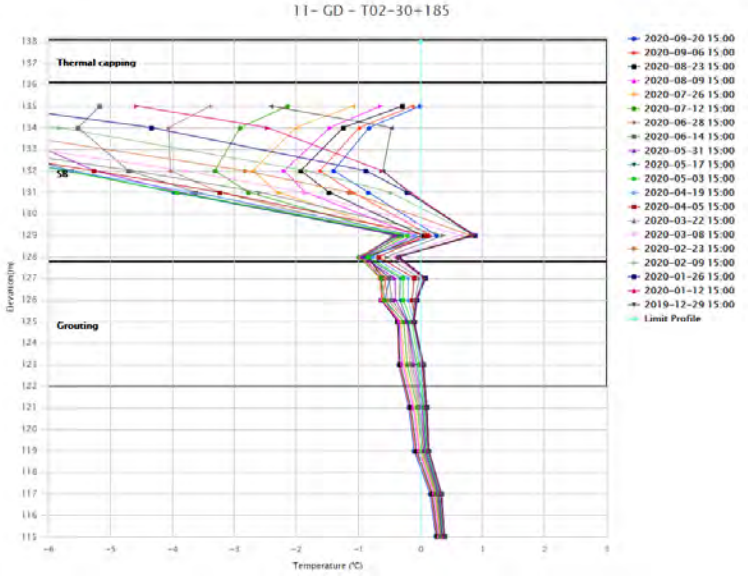


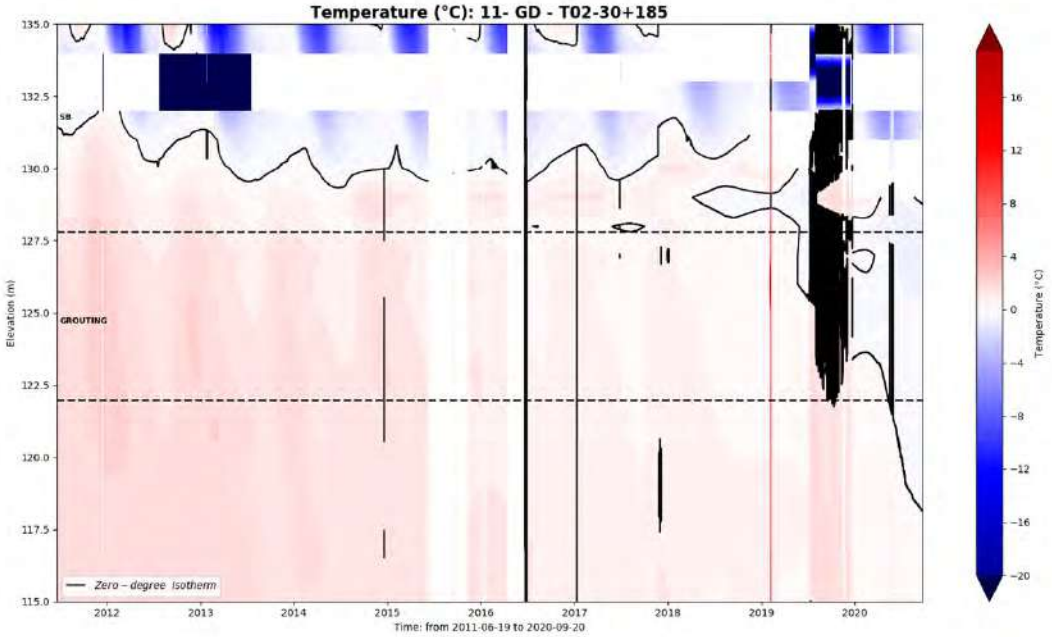


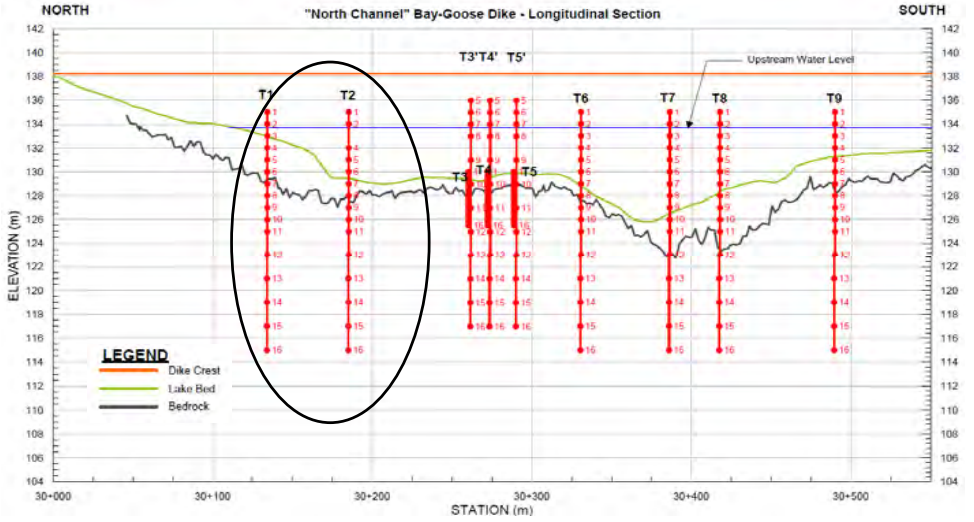


Bay Goose Dike TH02

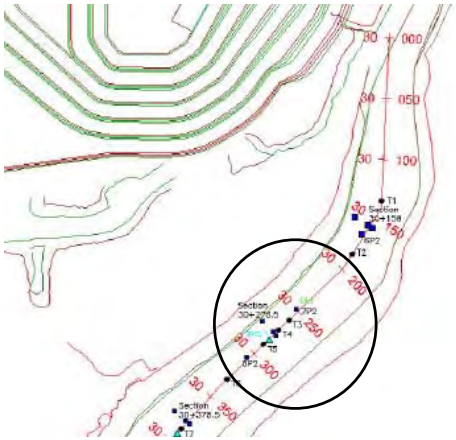


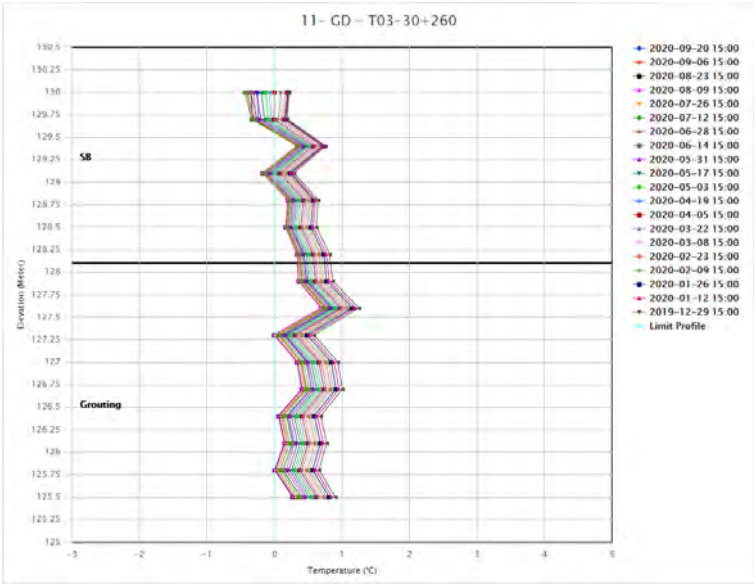


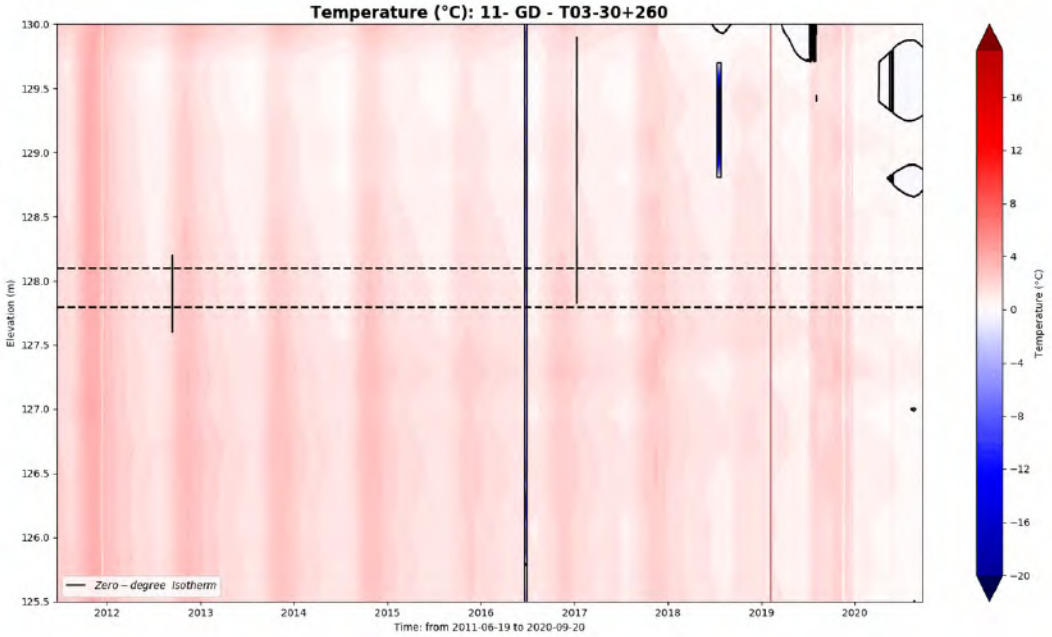


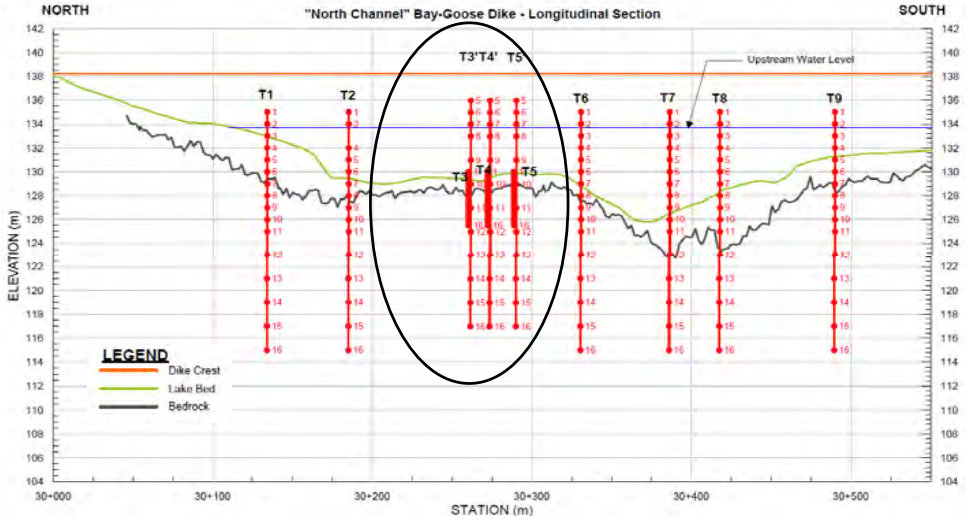


Bay Goose Dike TH03

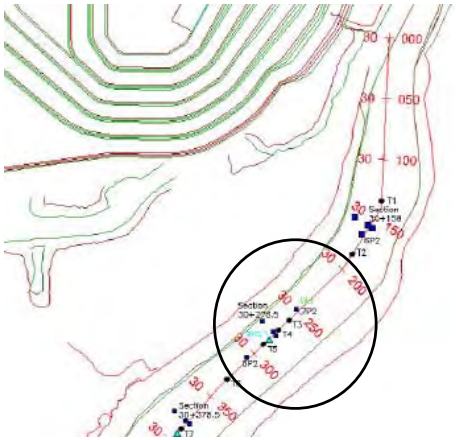


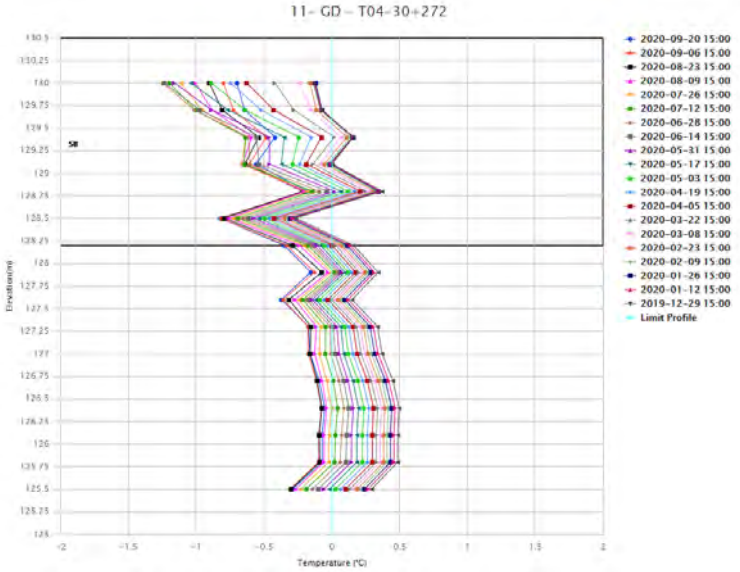


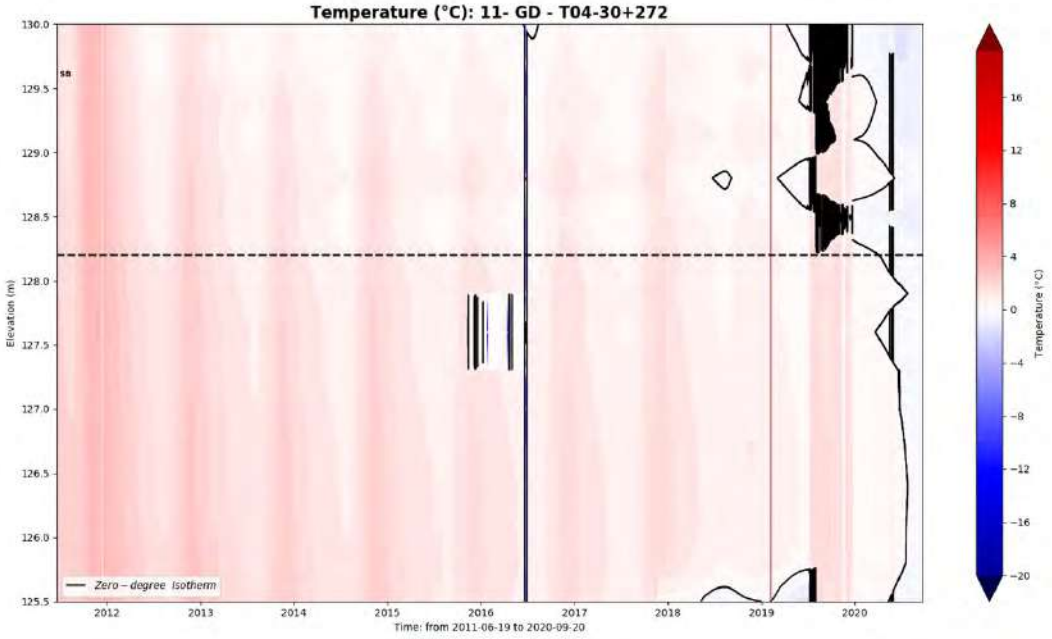


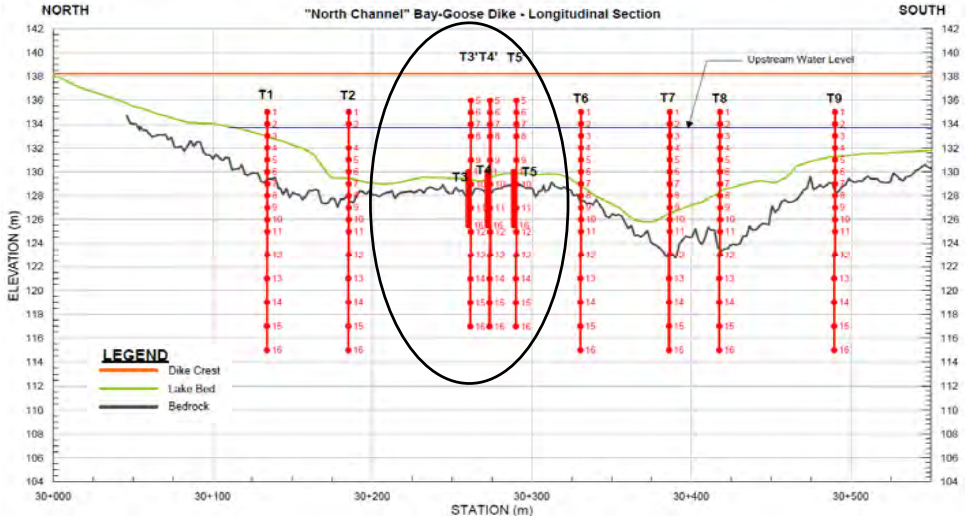


Bay Goose Dike TH04

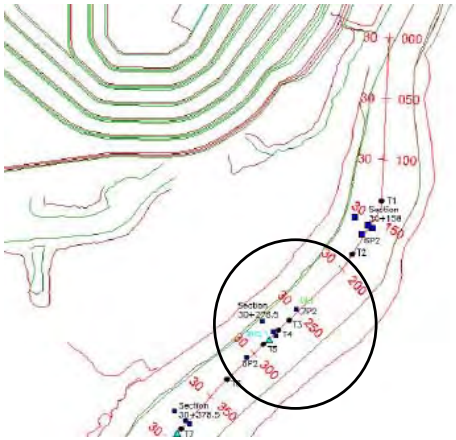


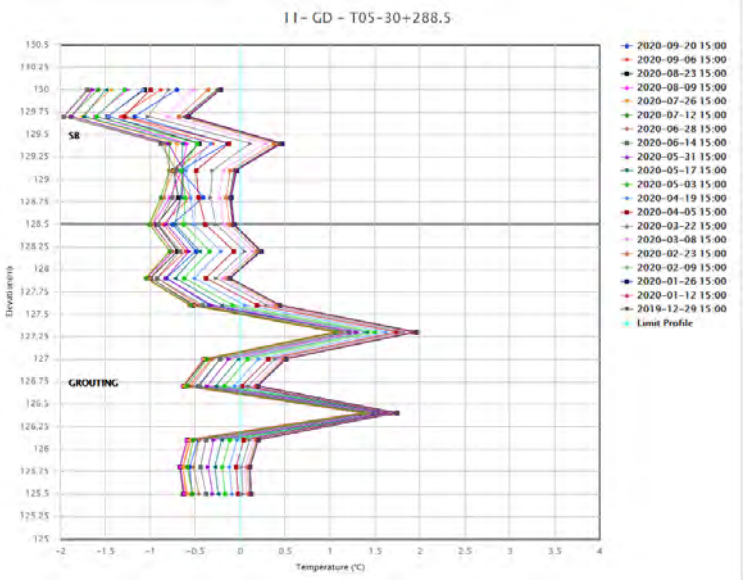


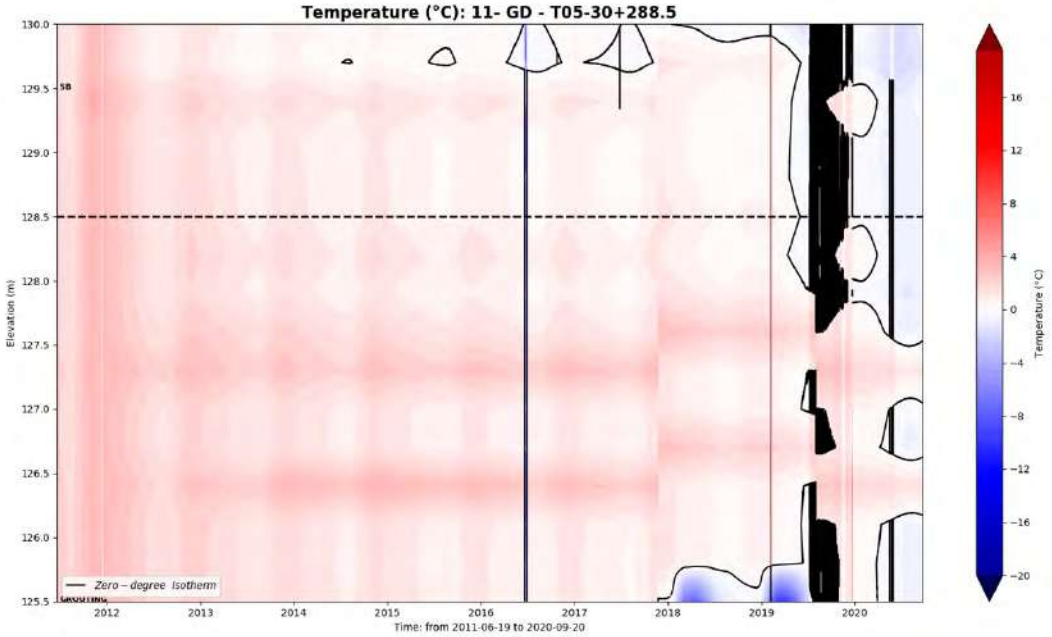


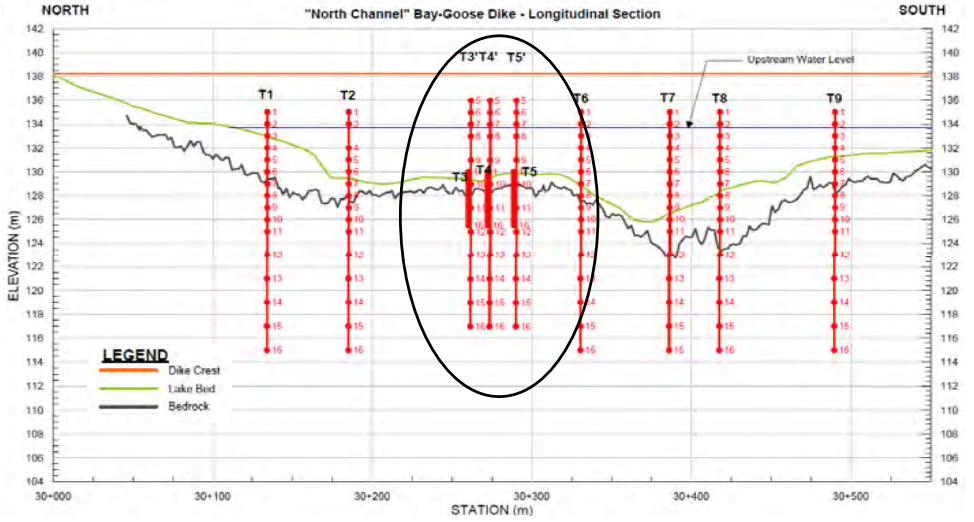


Bay Goose Dike TH05

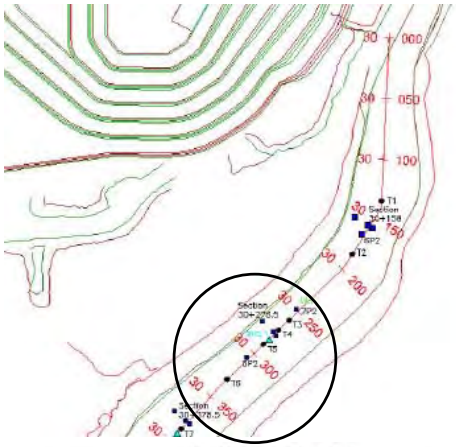


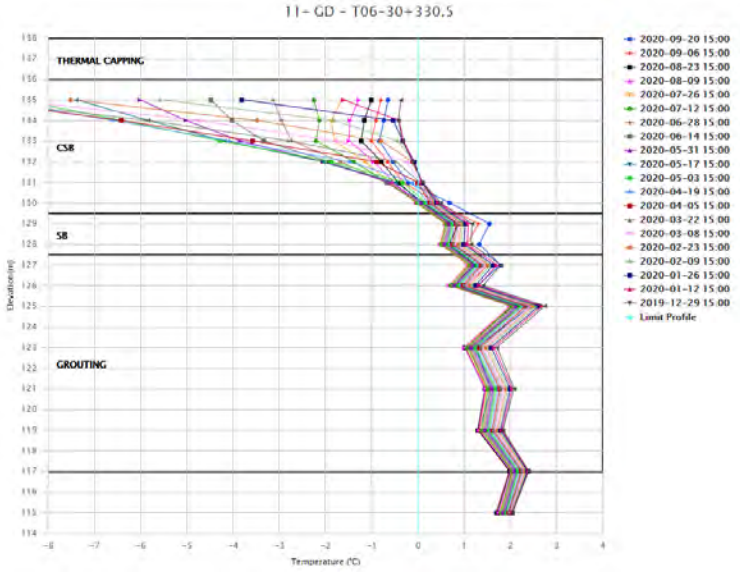


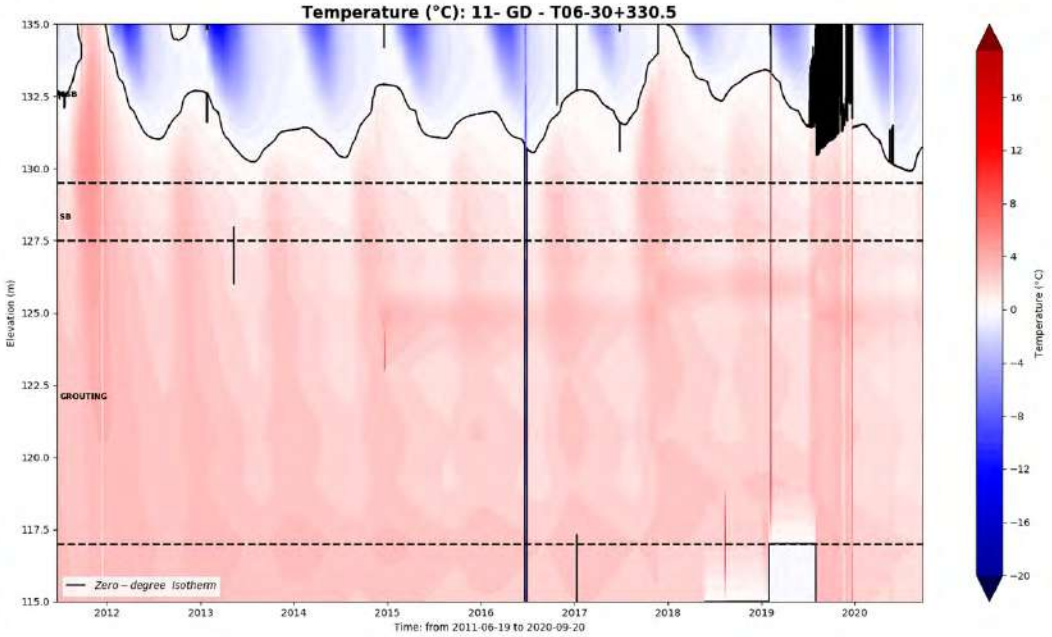


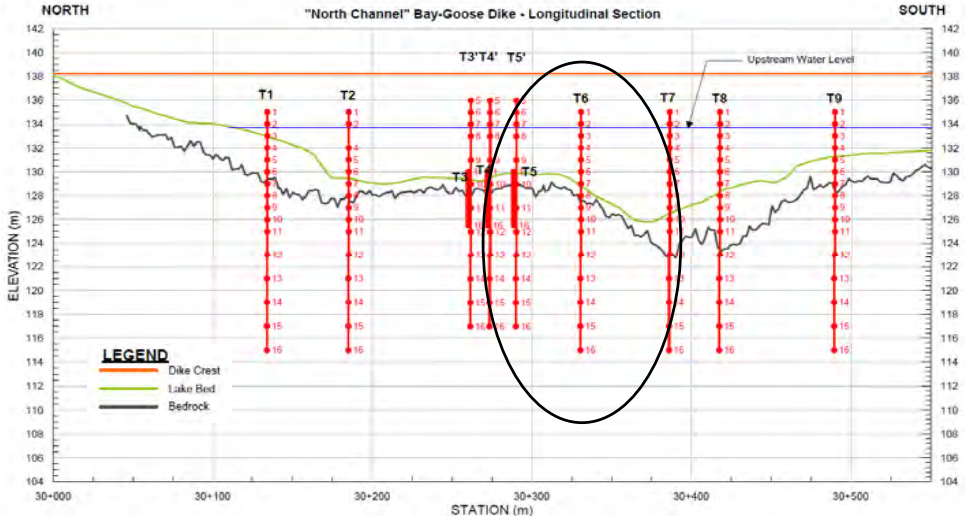


Bay Goose Dike TH06

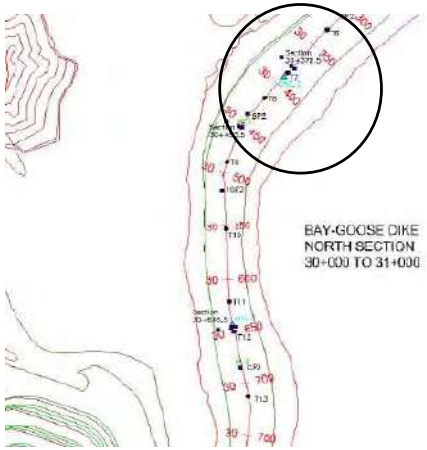


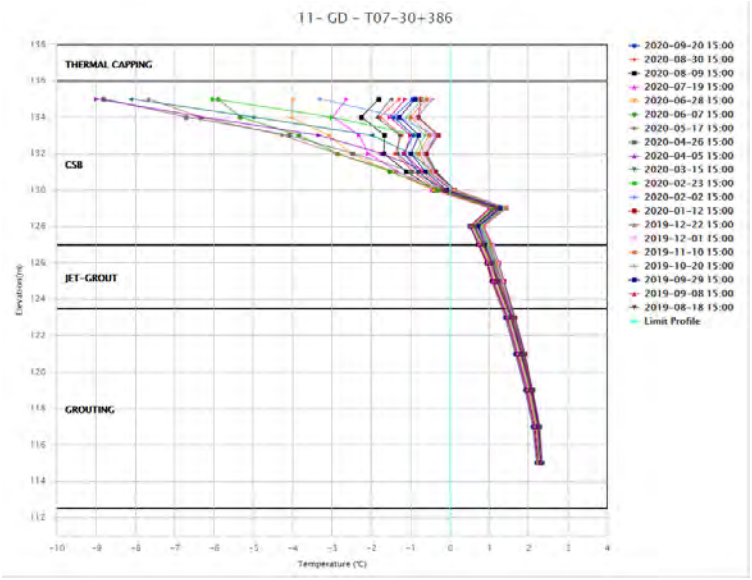


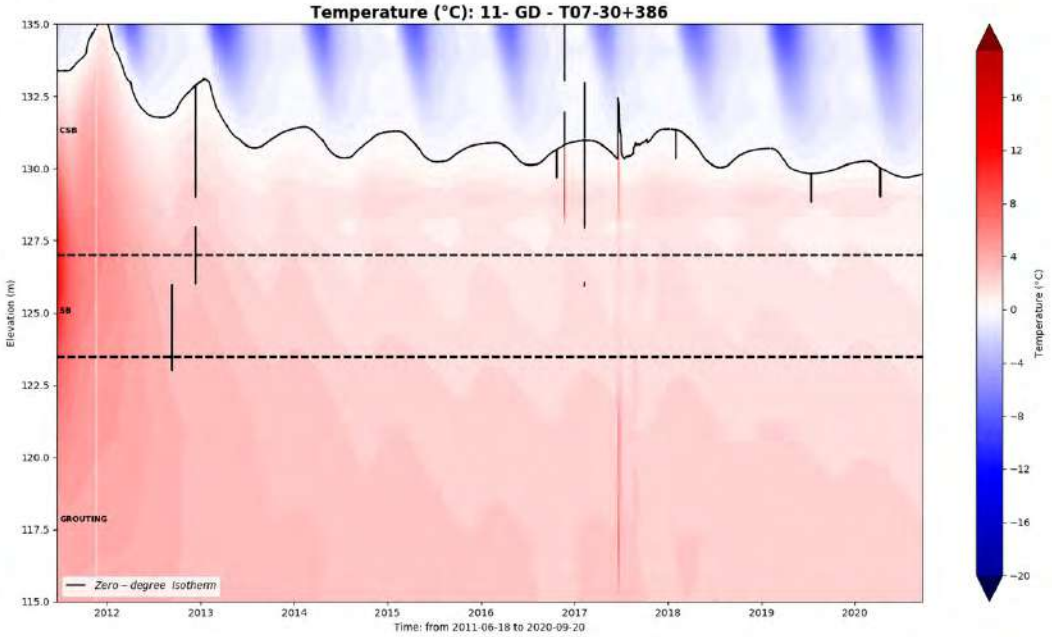


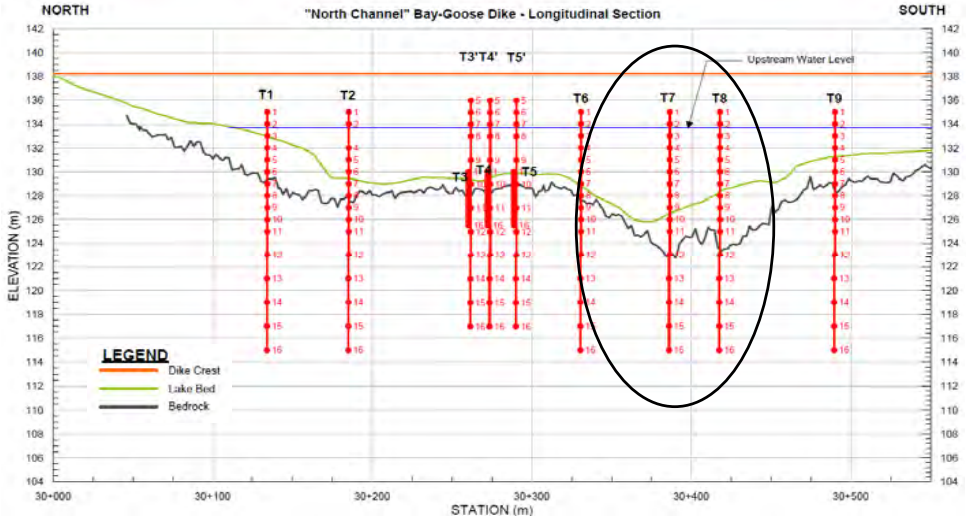


Bay Goose Dike TH07

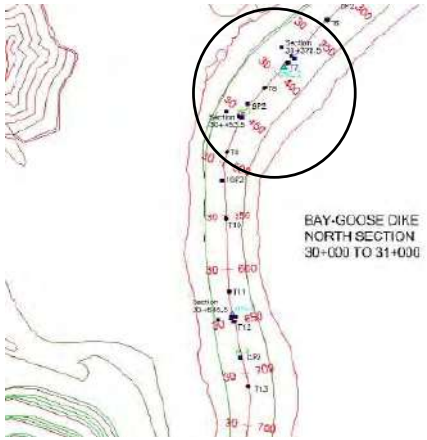


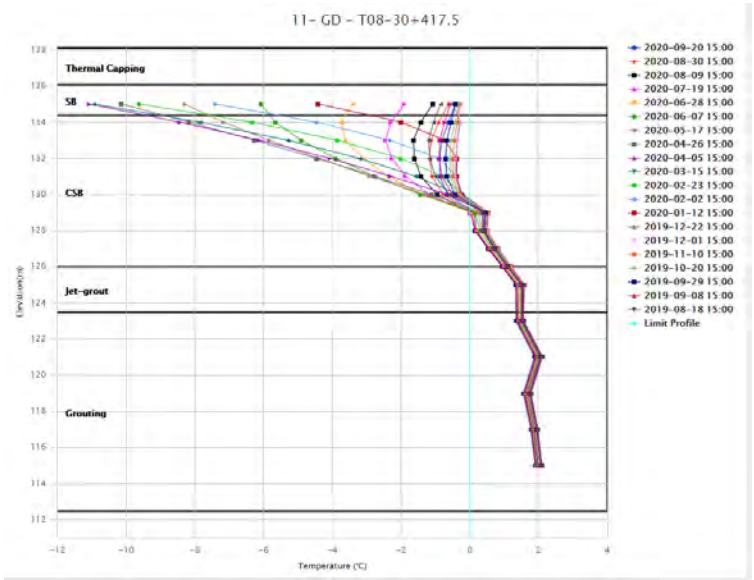


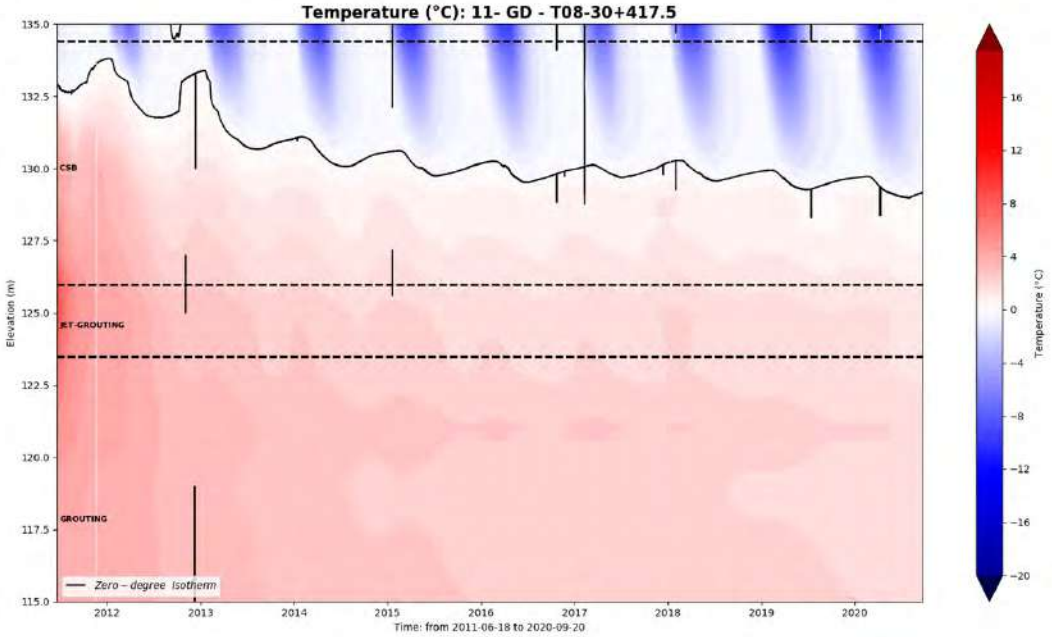


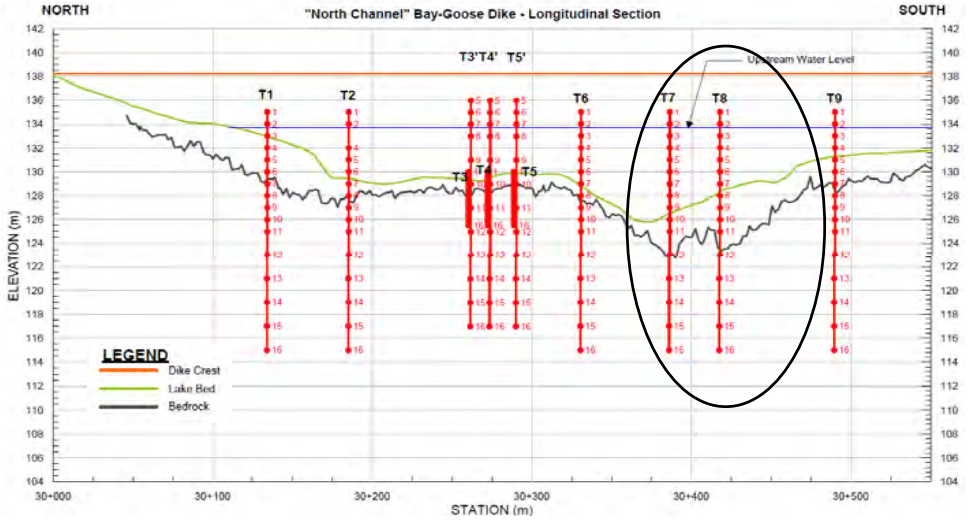


Bay Goose Dike TH08

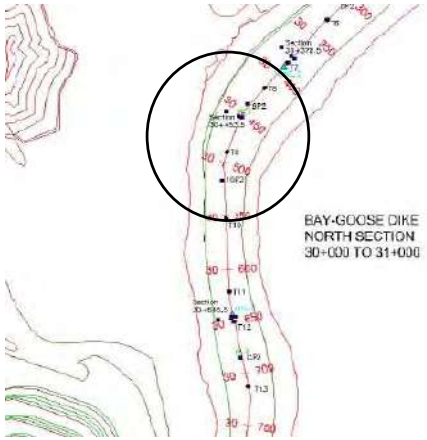


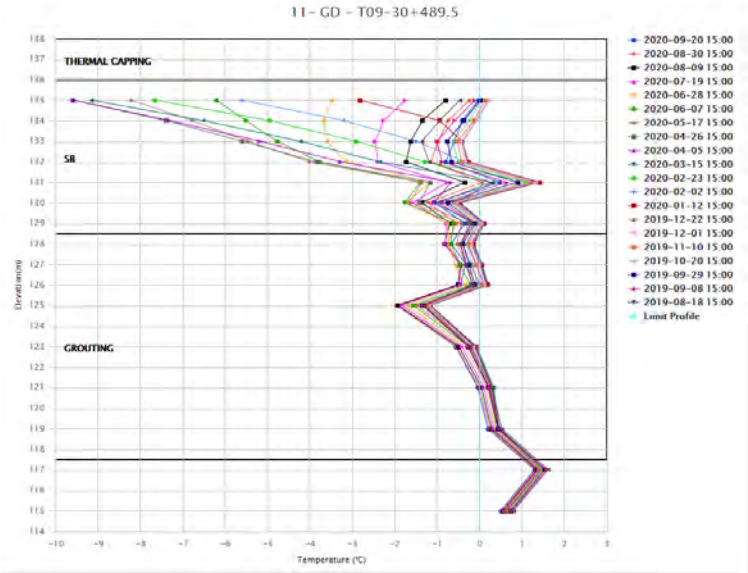


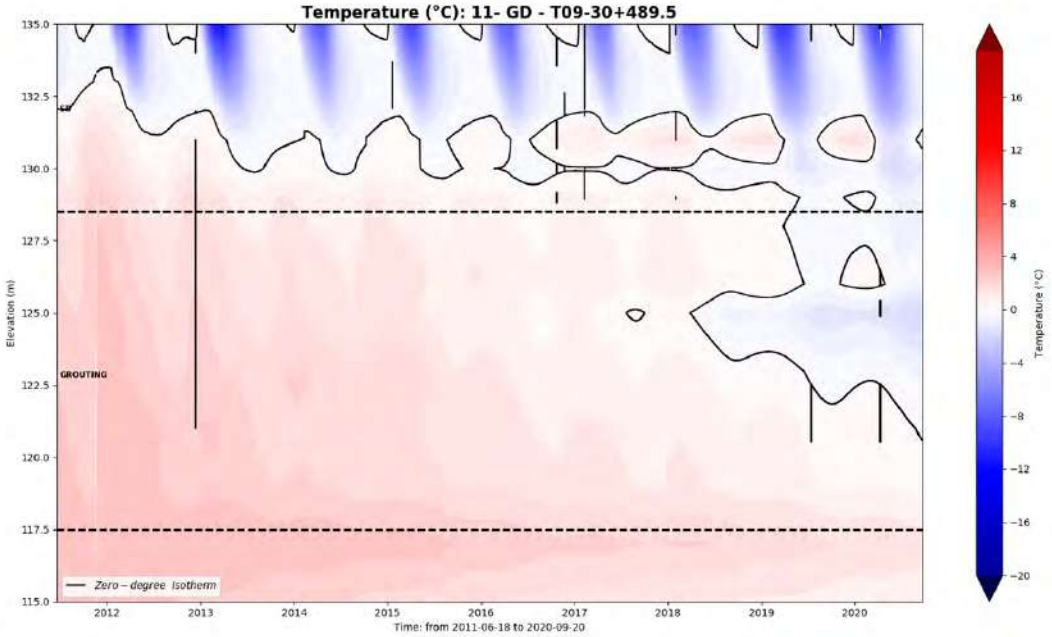


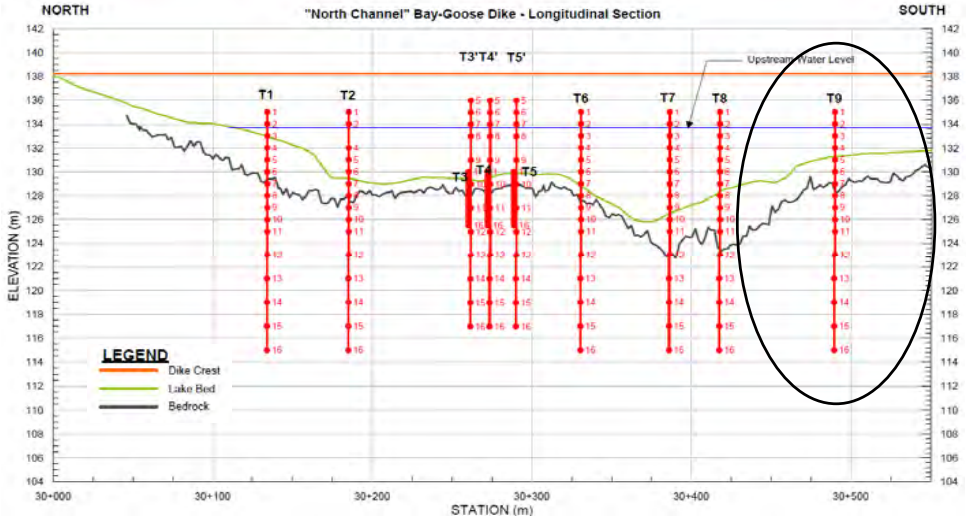


Bay Goose Dike TH09

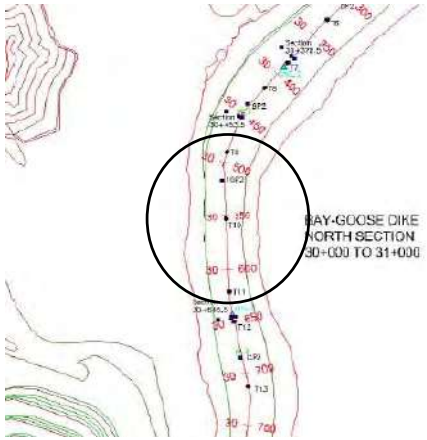


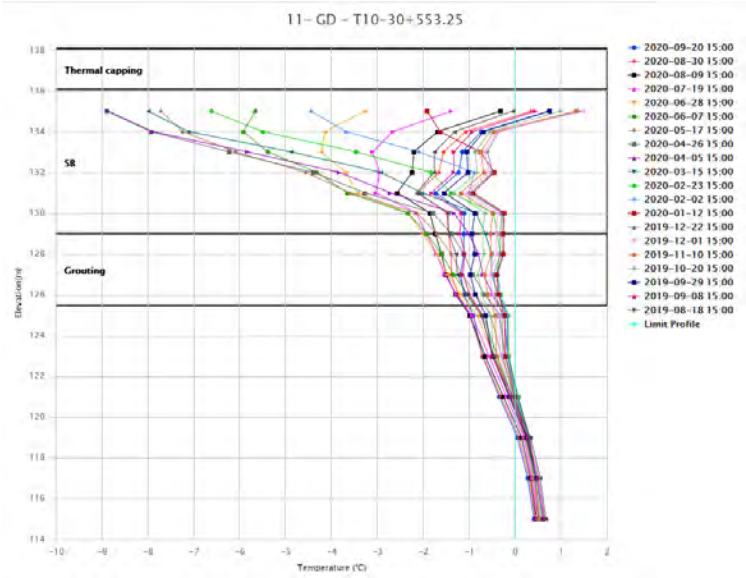


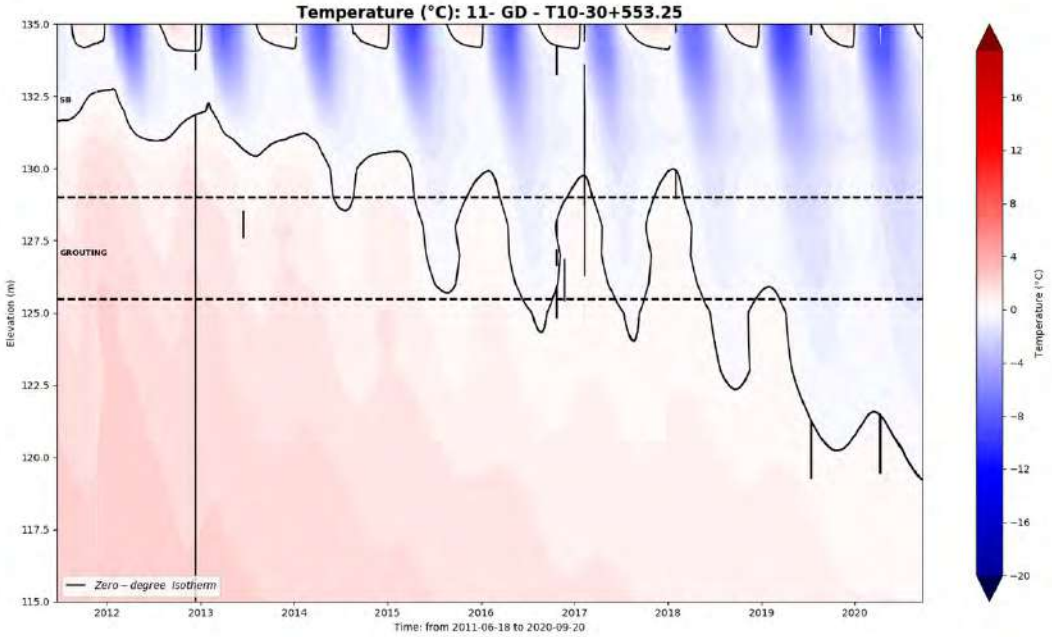


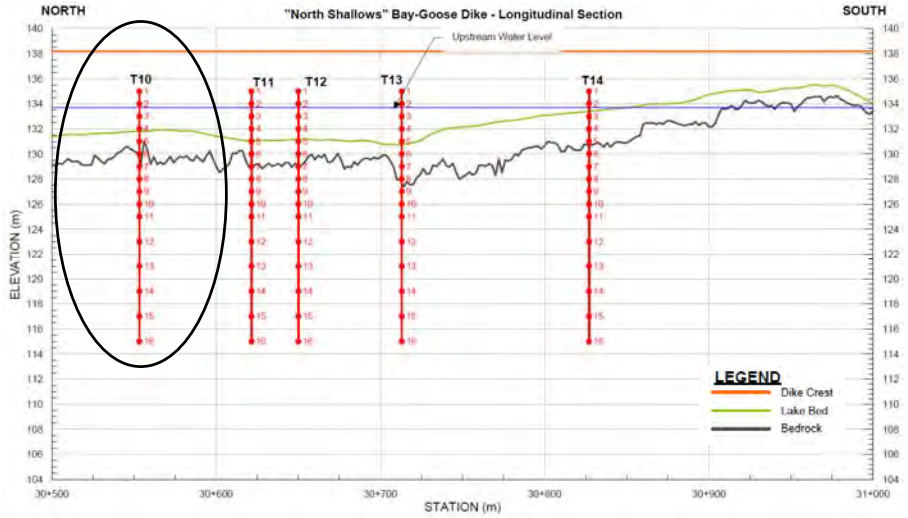


Bay Goose Dike TH10

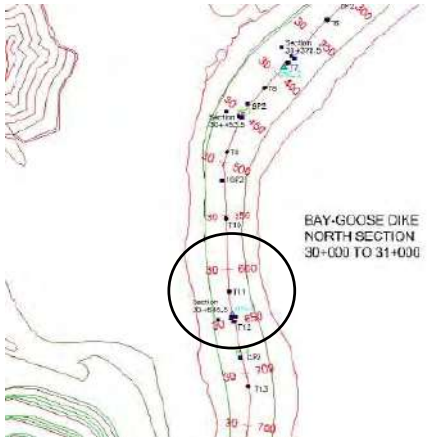


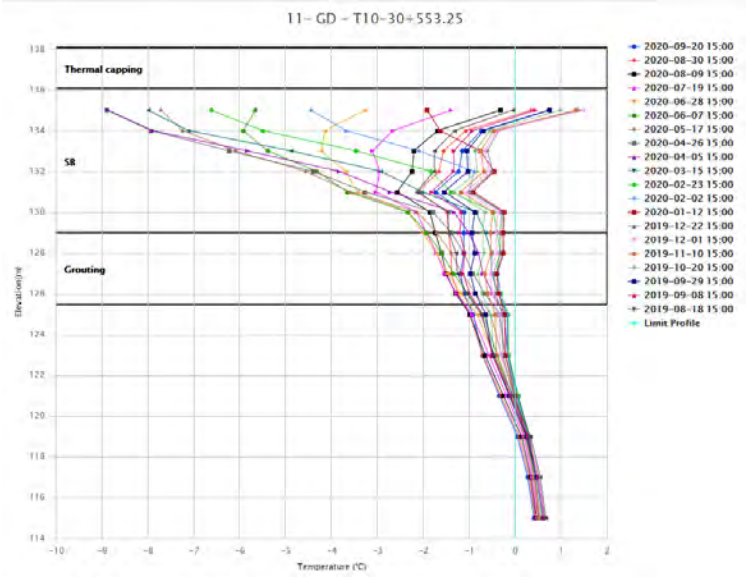


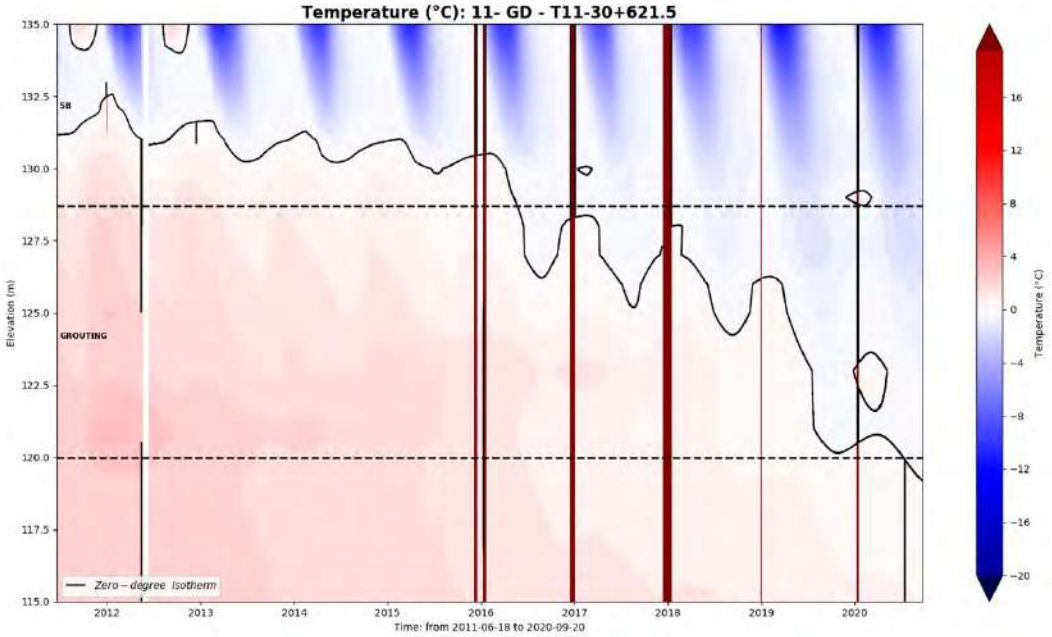


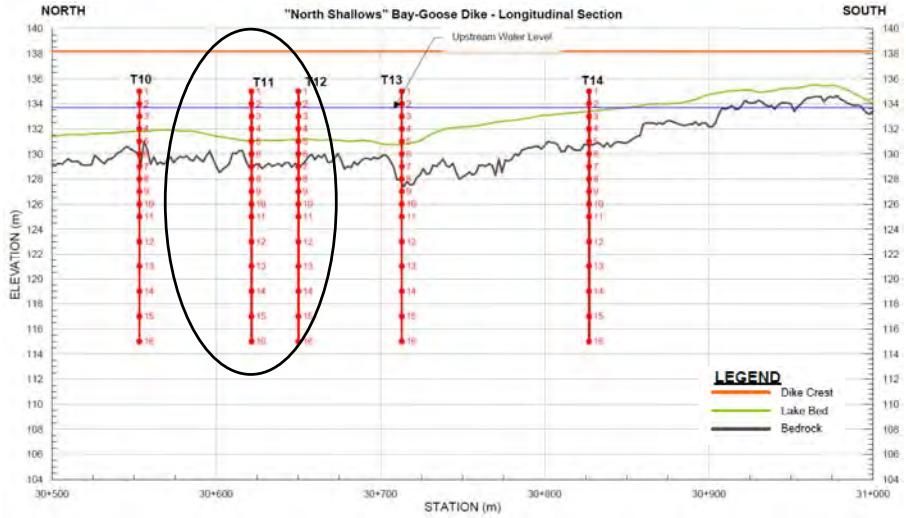


Bay Goose Dike TH11

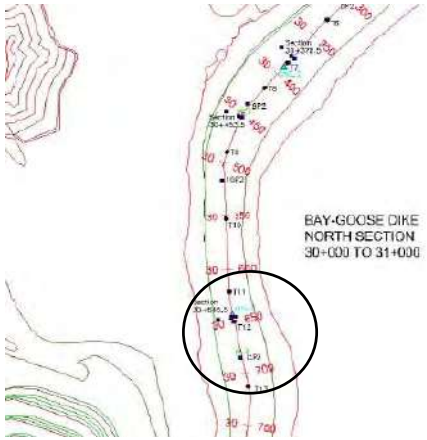


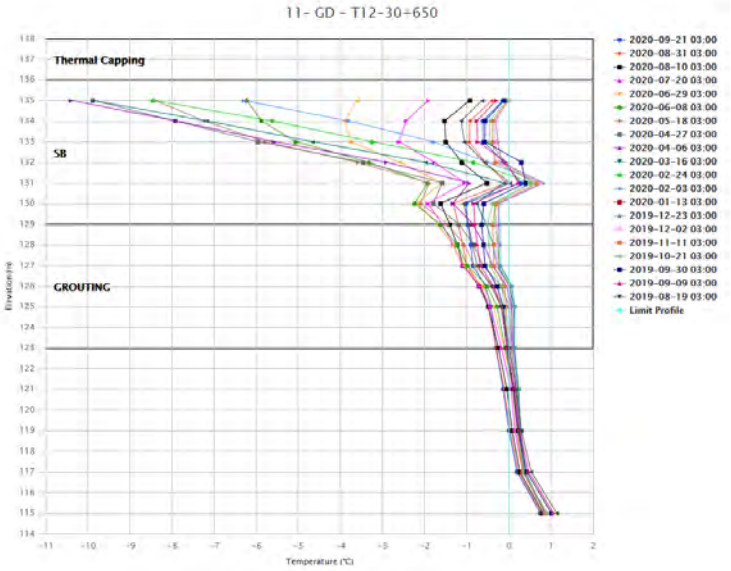


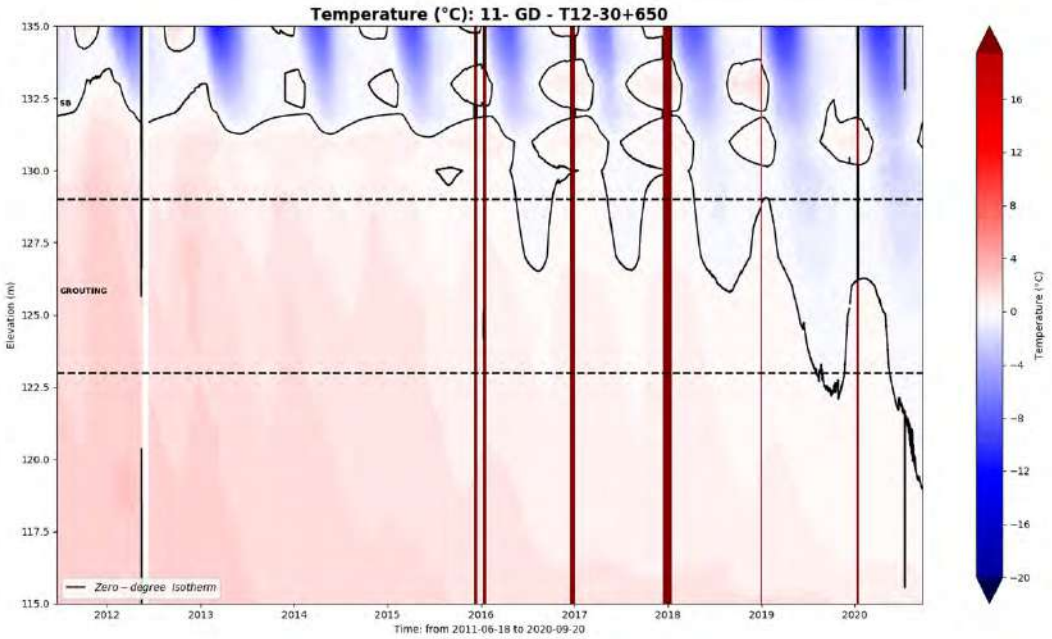


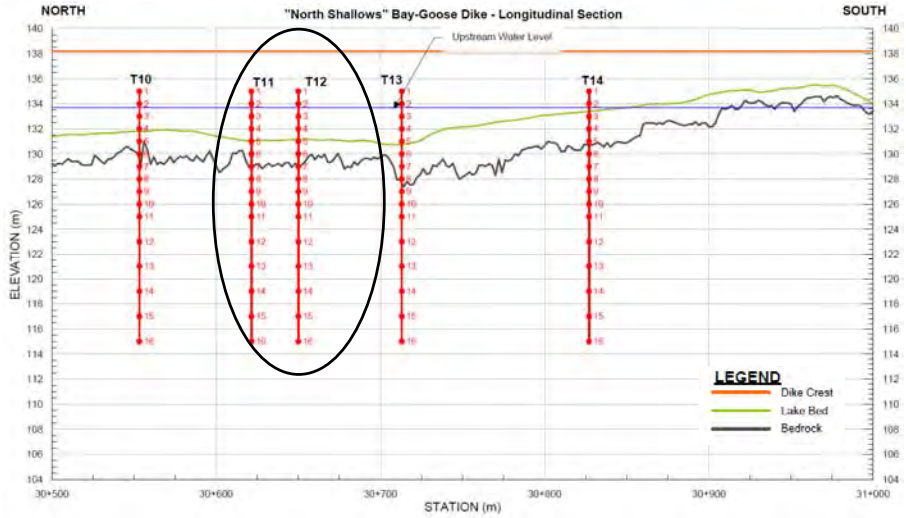


Bay Goose Dike TH12

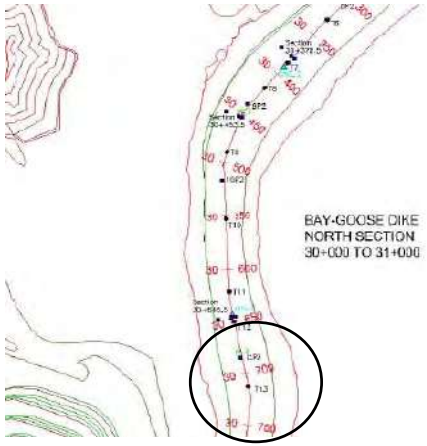


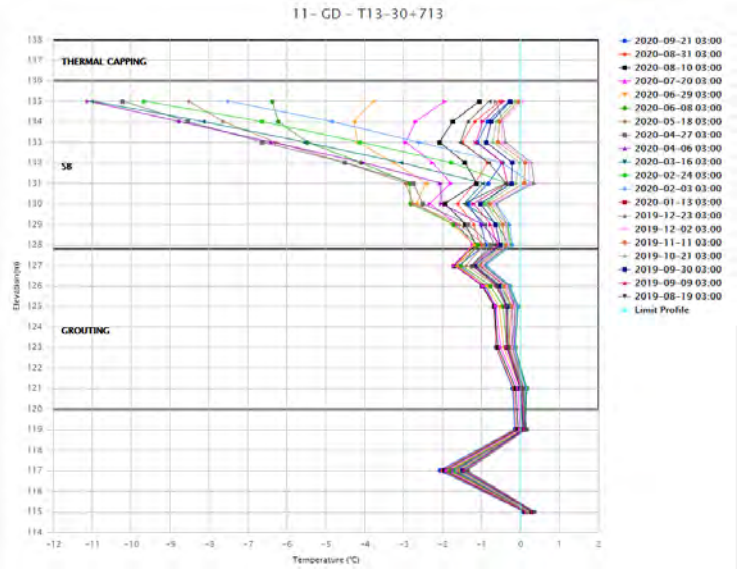


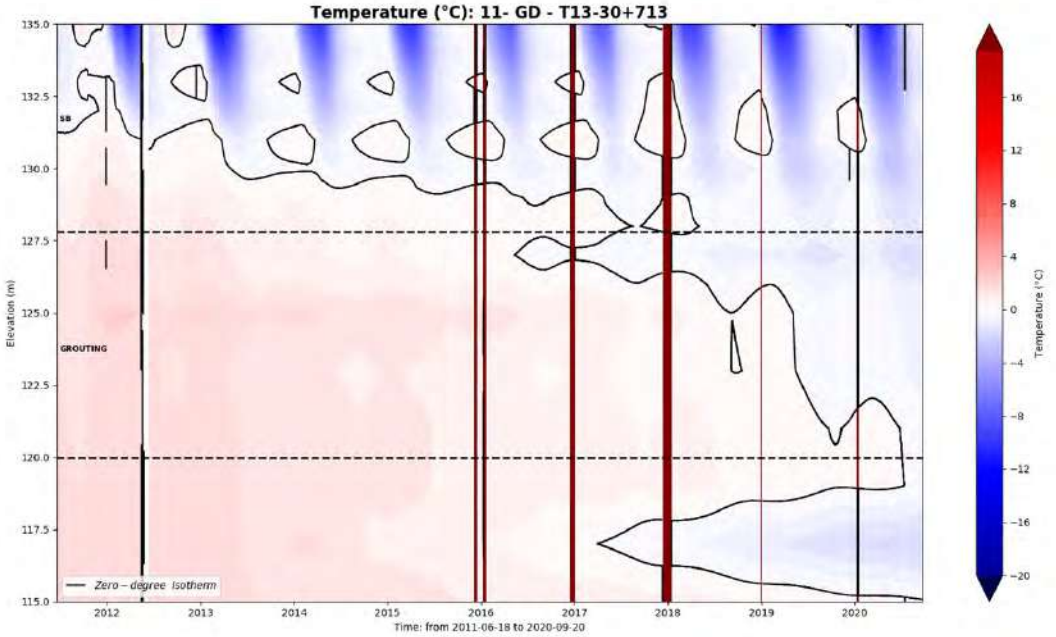


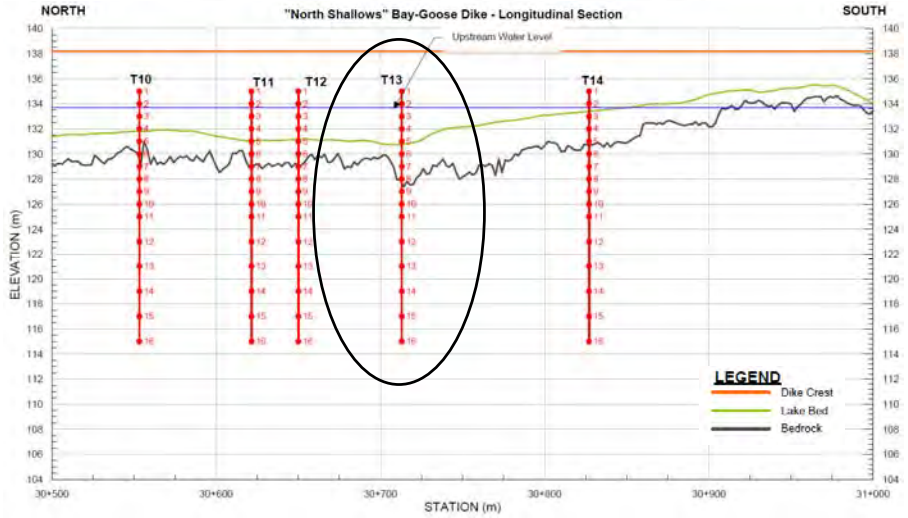


Bay Goose Dike TH13

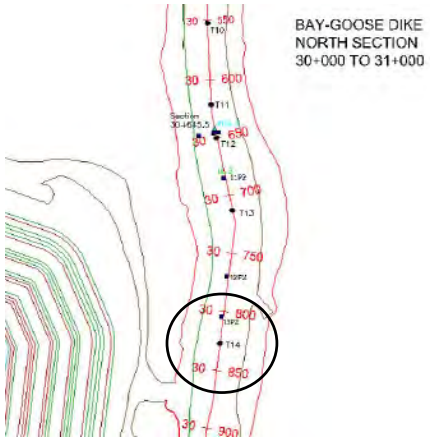


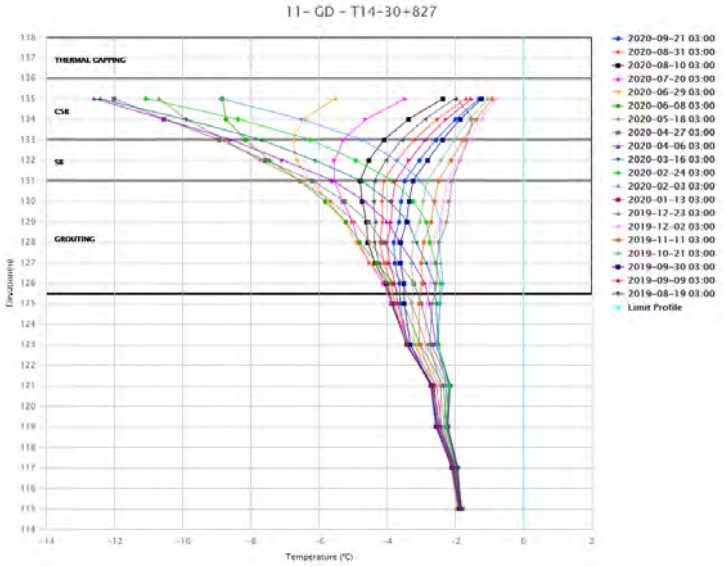


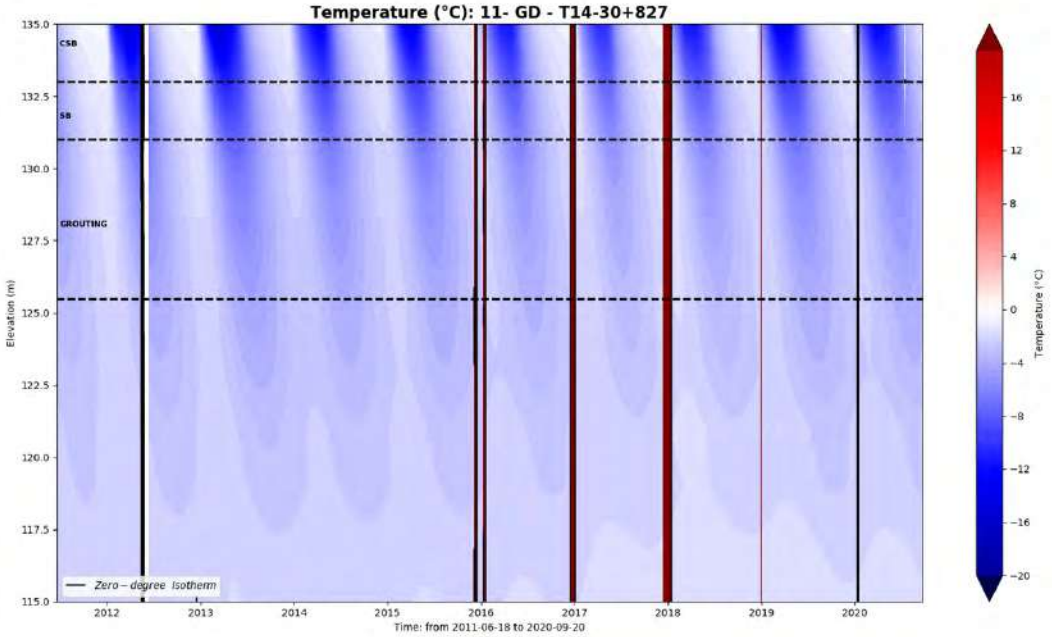


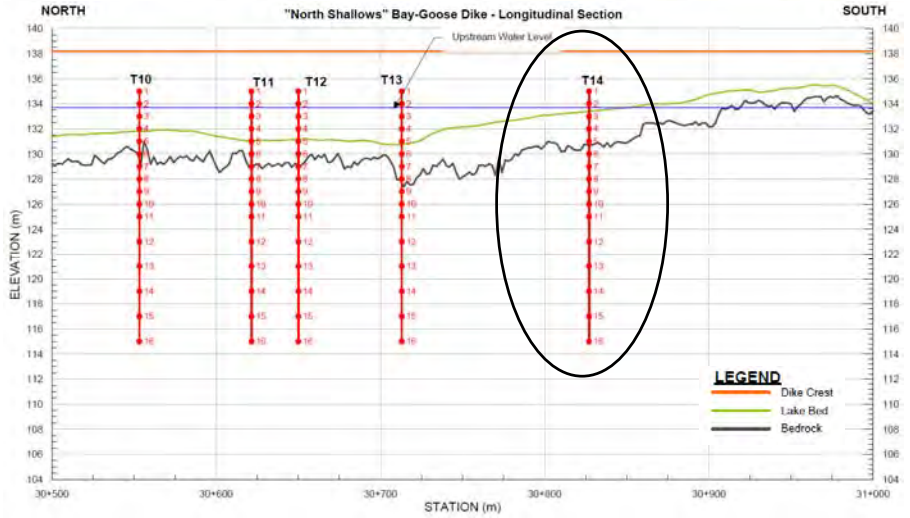


Bay Goose Dike TH14

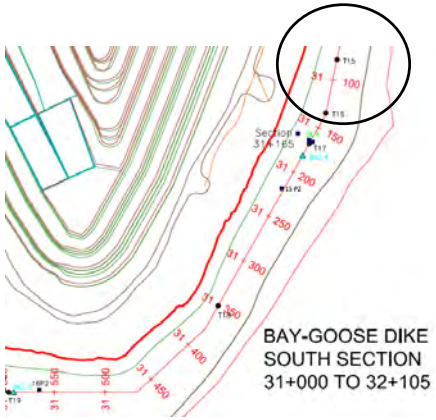


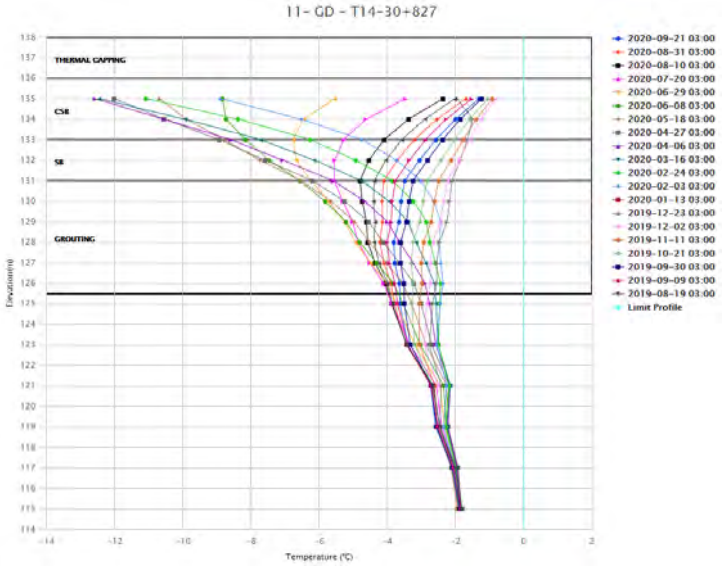


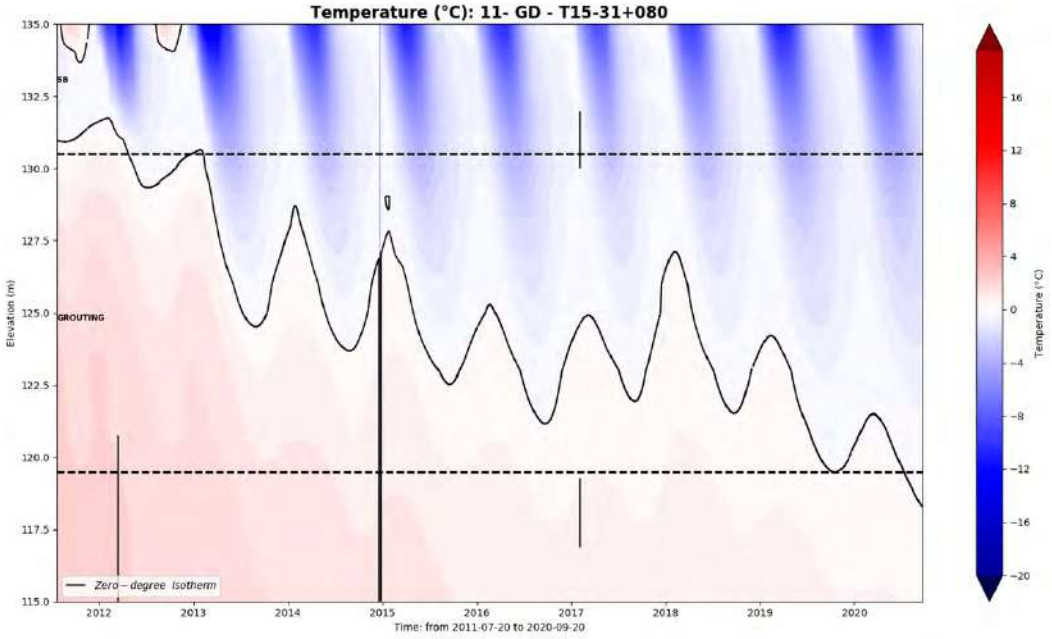


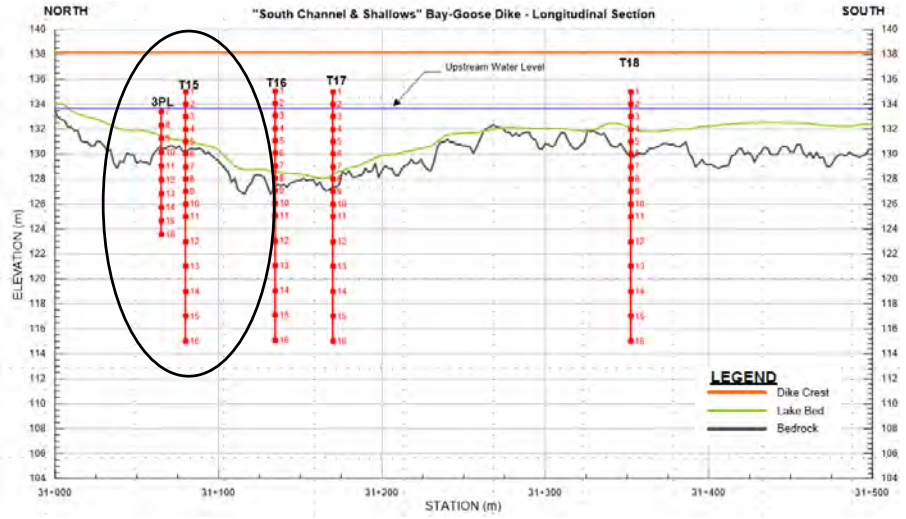


Bay Goose Dike TH15

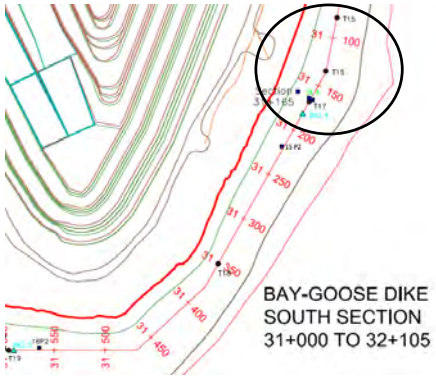


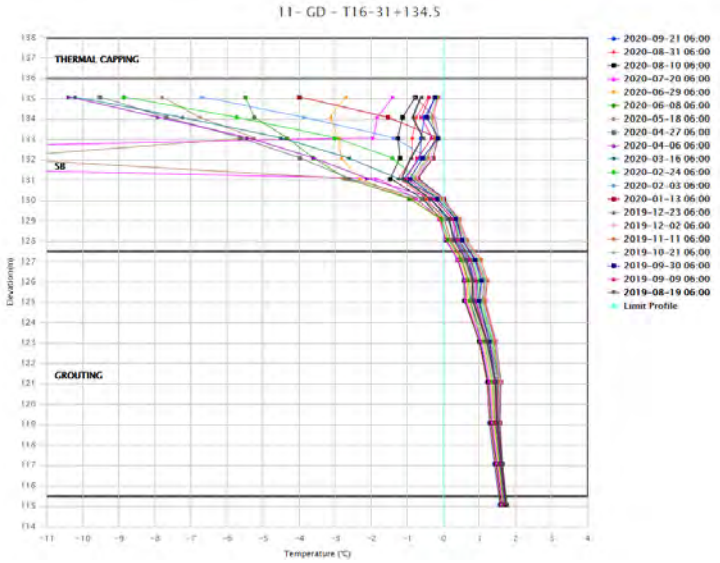


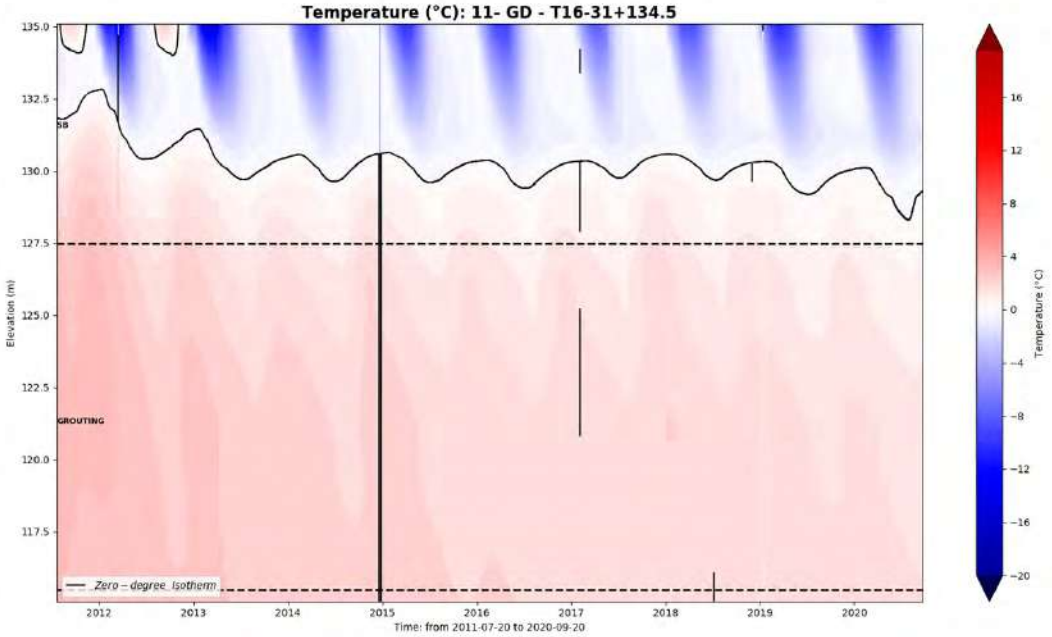


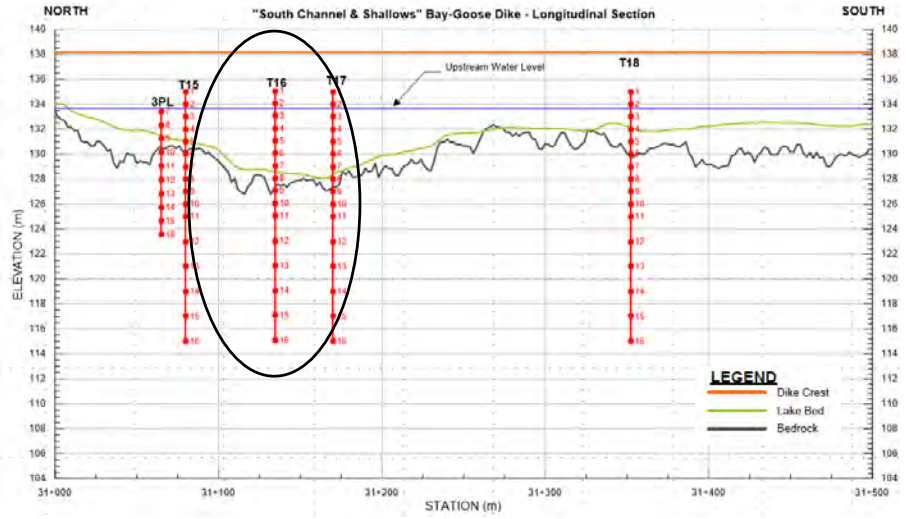


Bay Goose Dike TH16

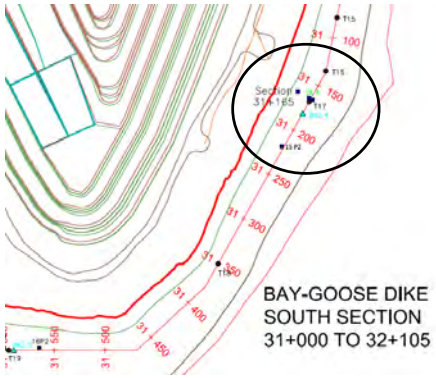


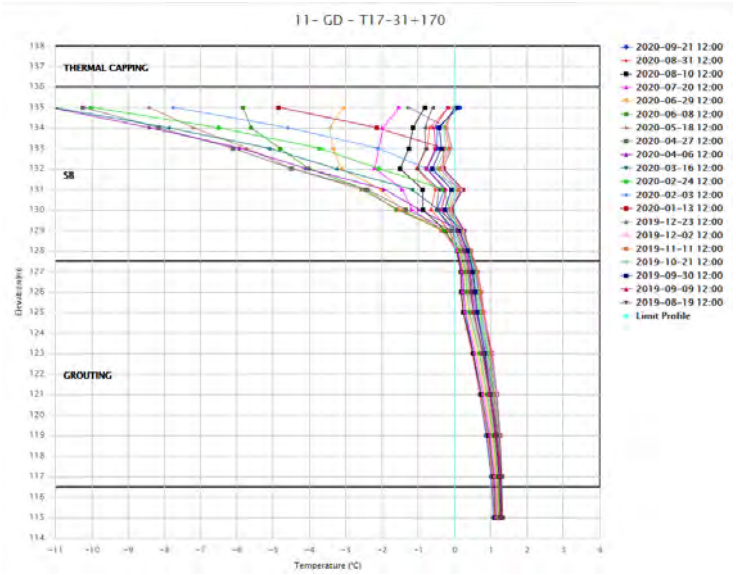


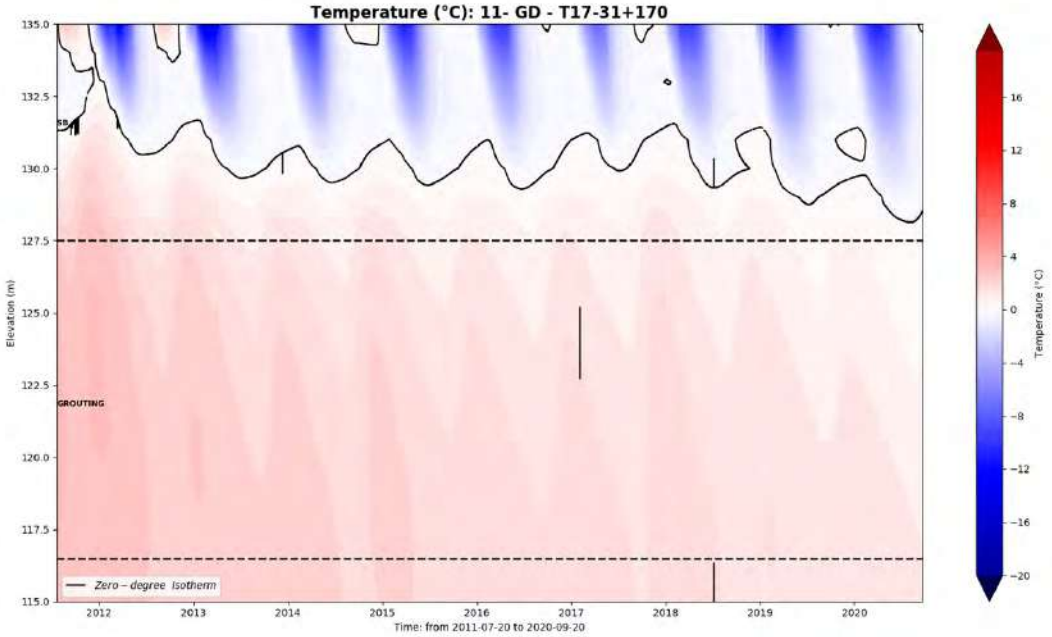


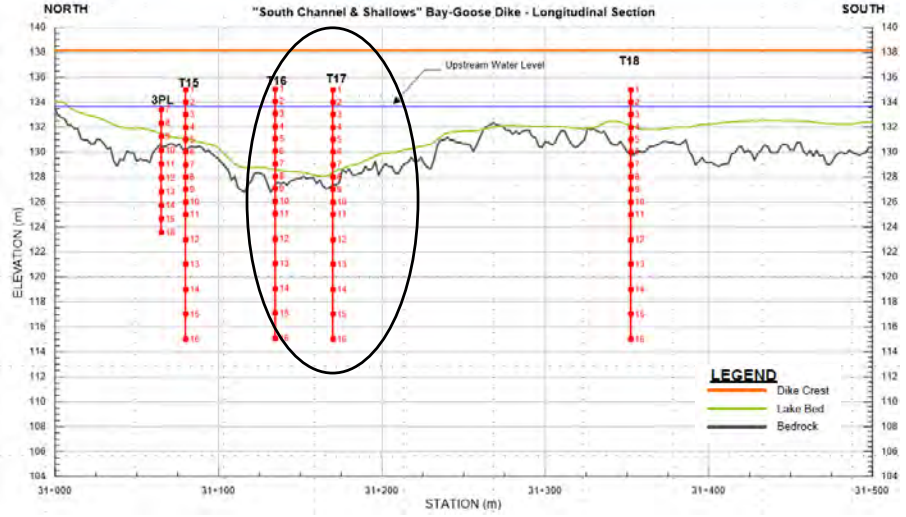


Bay Goose Dike TH17

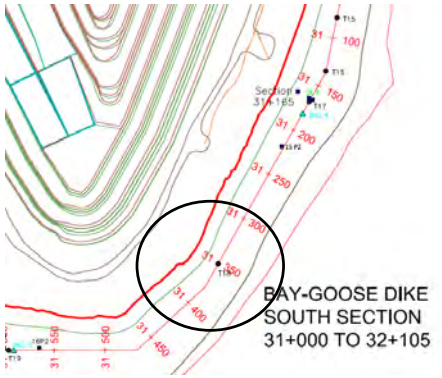


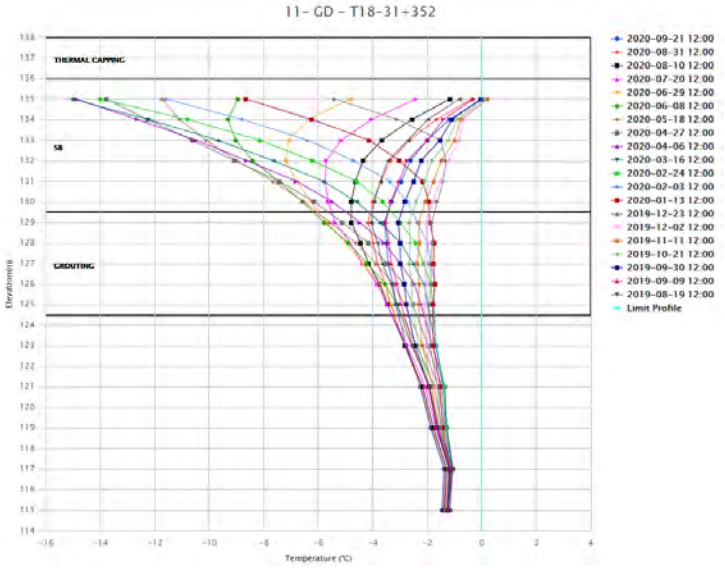


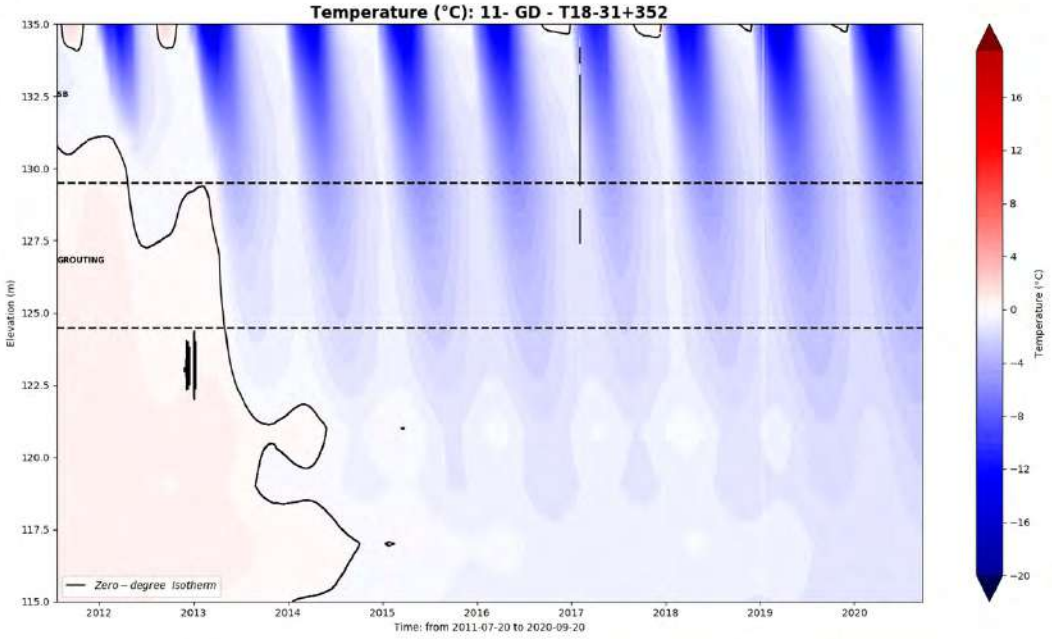


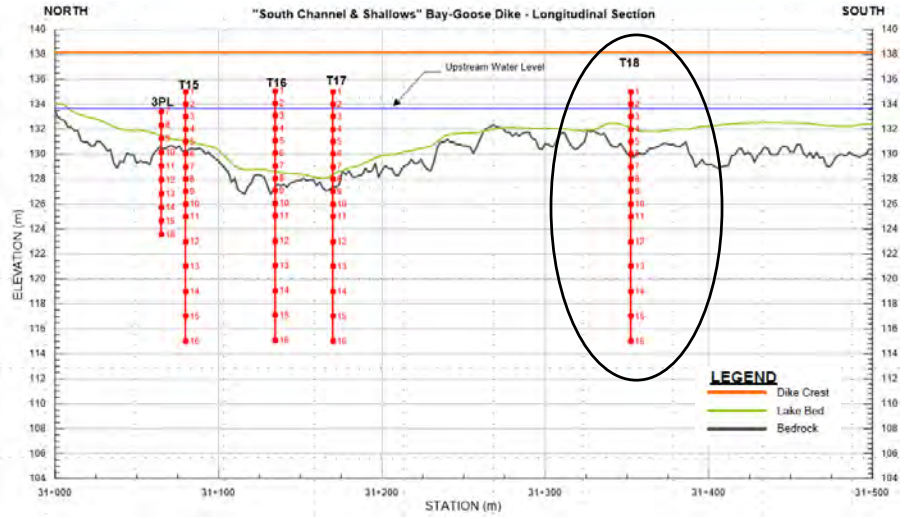


Bay Goose Dike TH18

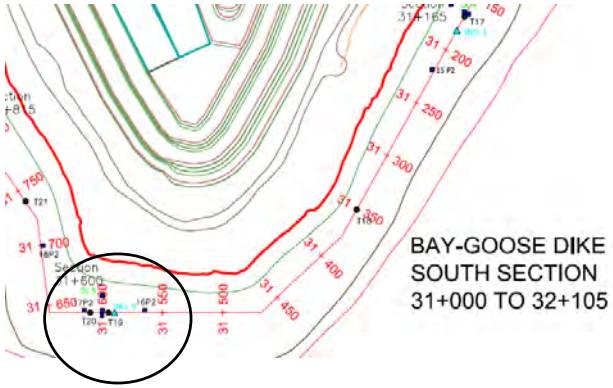


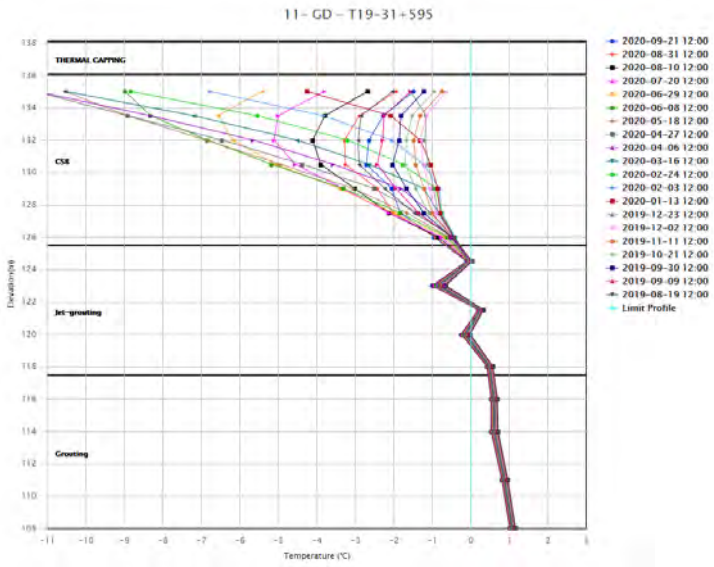


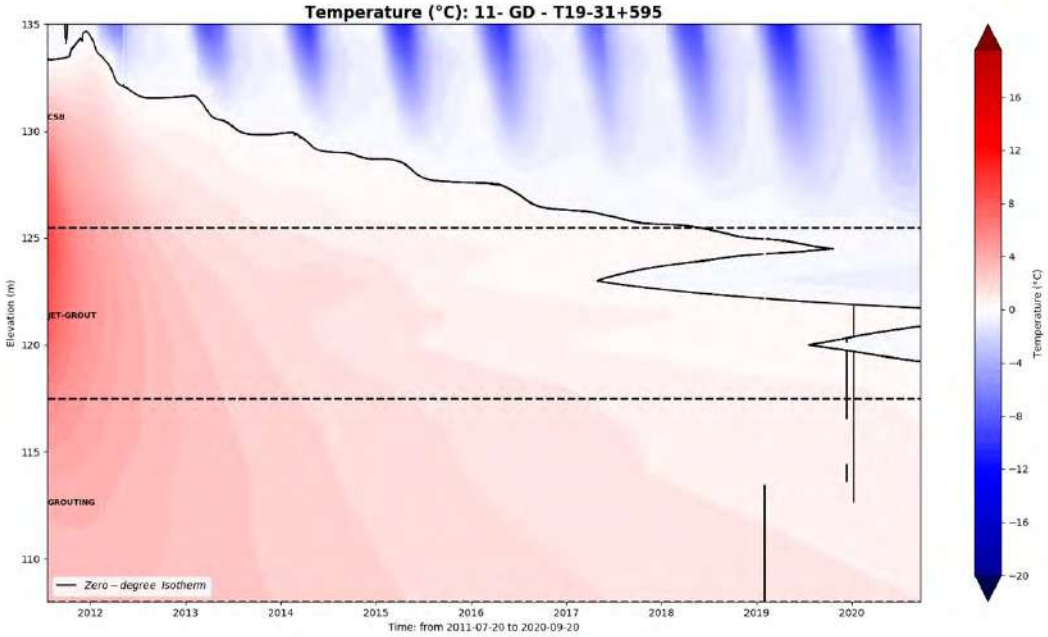


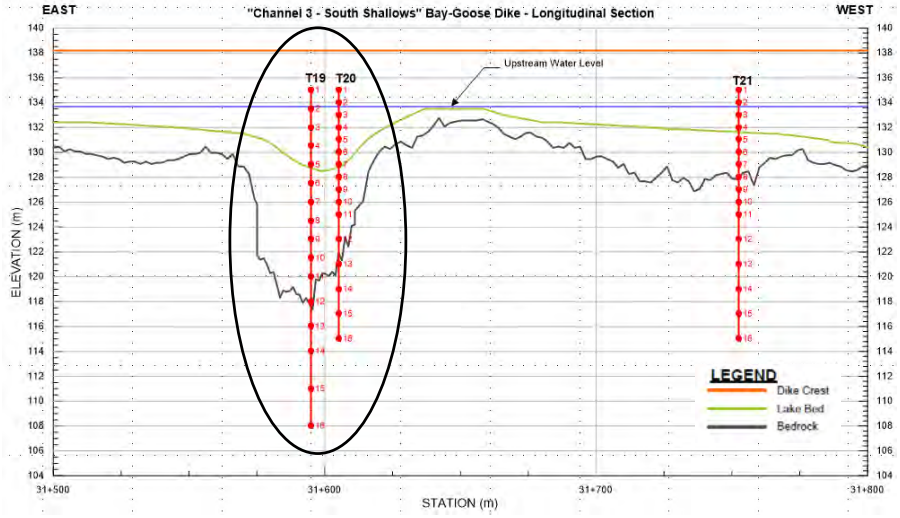


Bay Goose Dike TH19

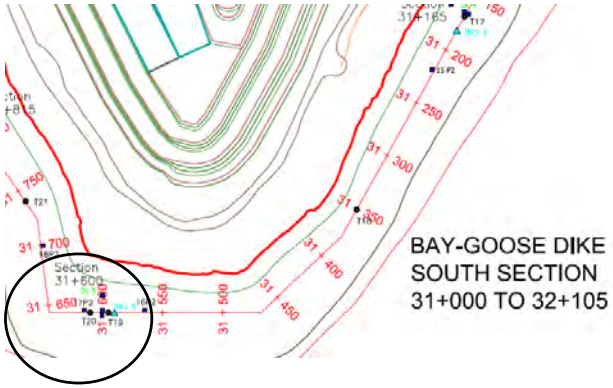


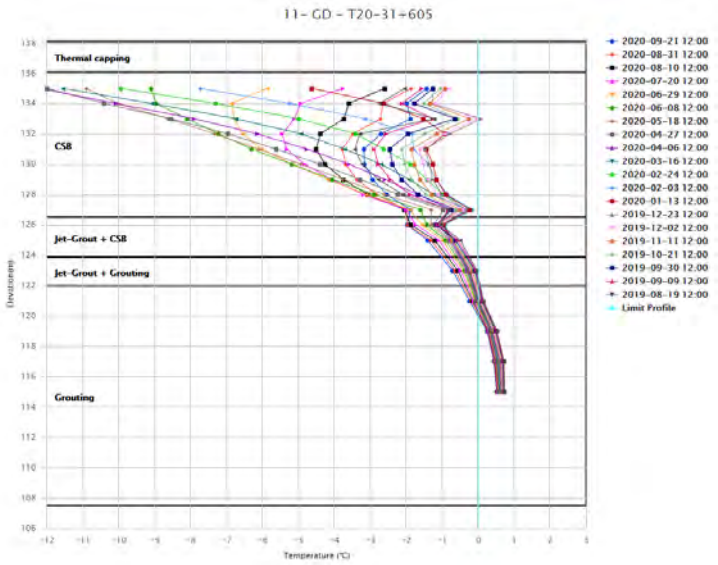


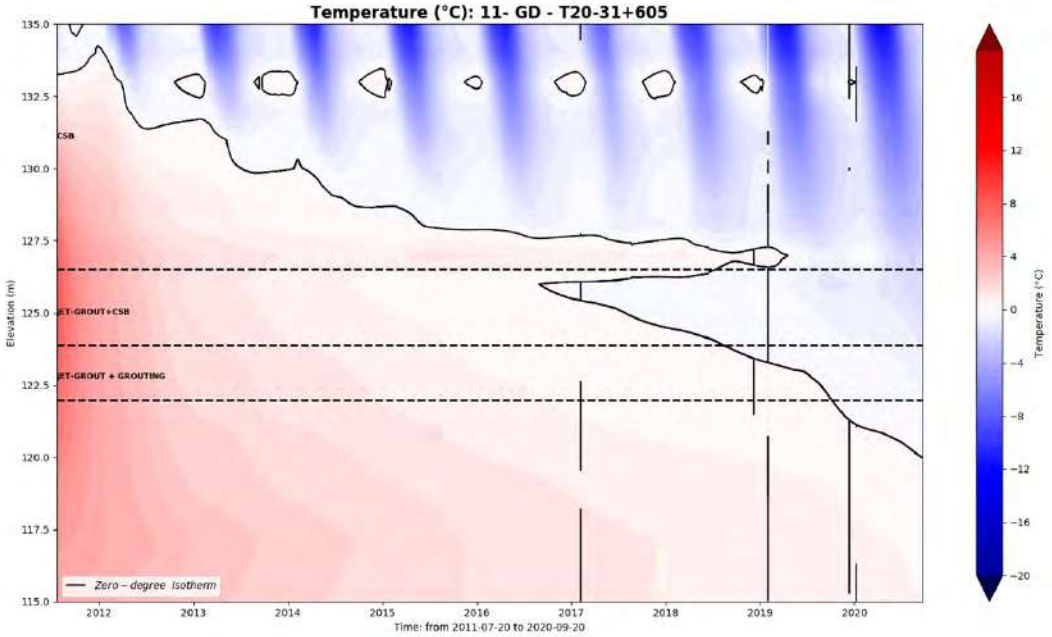


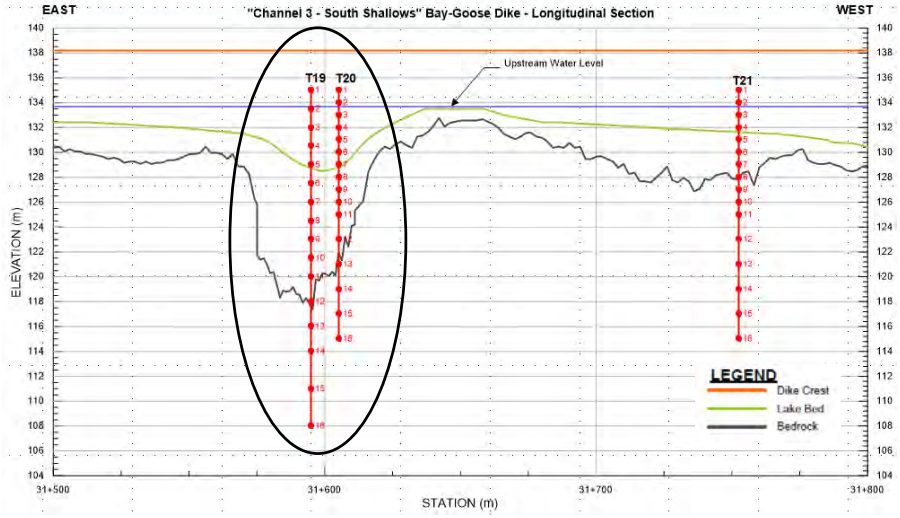


Bay Goose Dike TH20

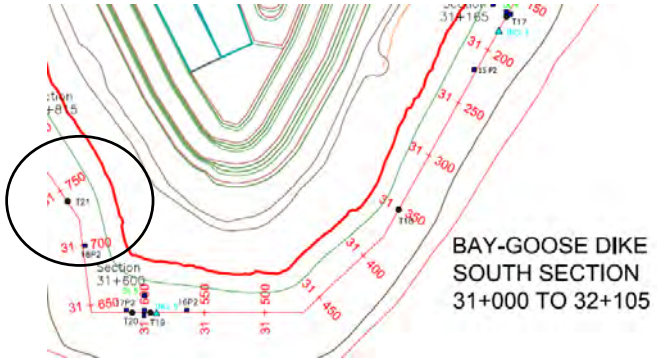


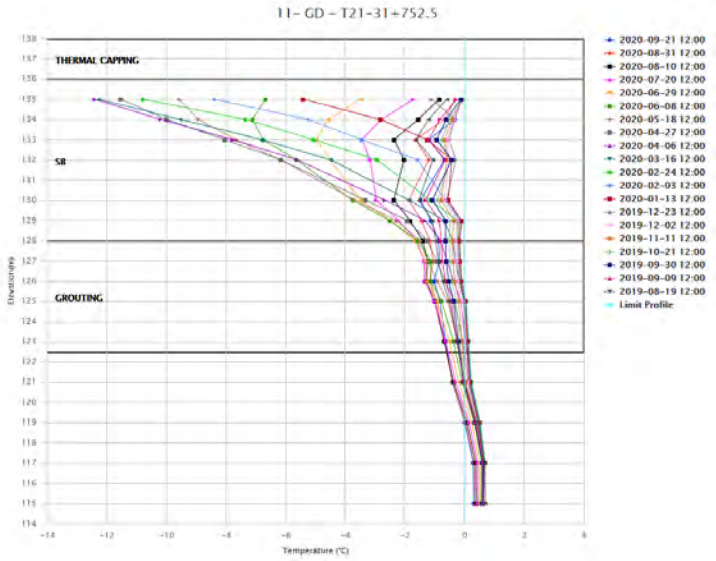


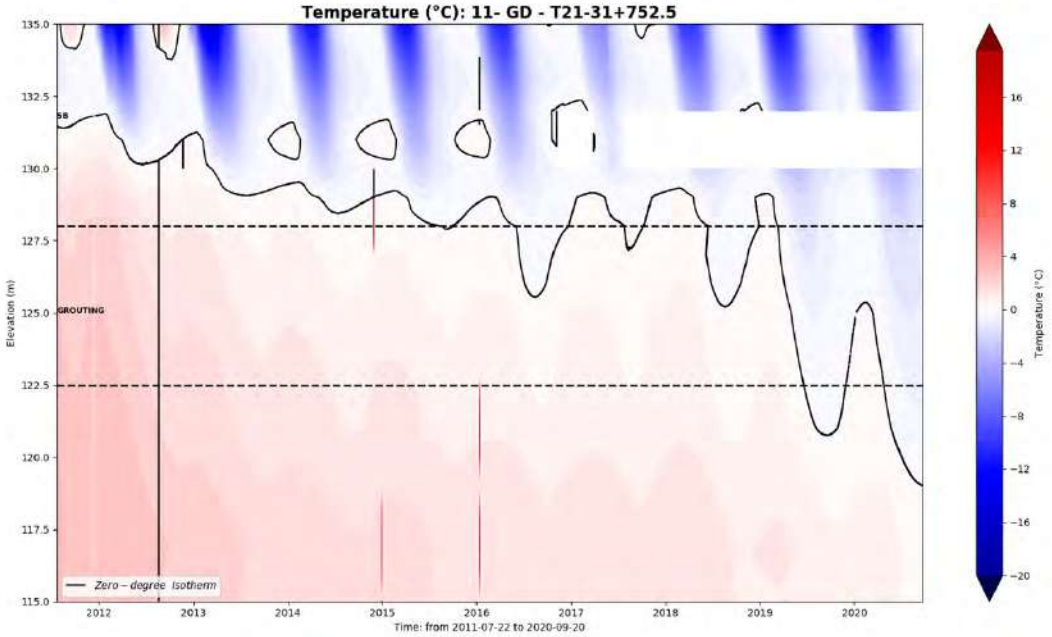


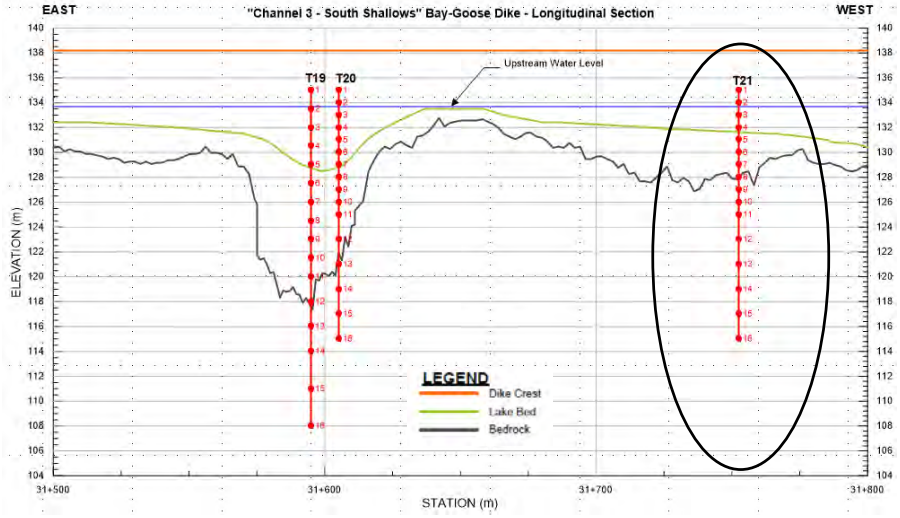


Bay Goose Dike TH21

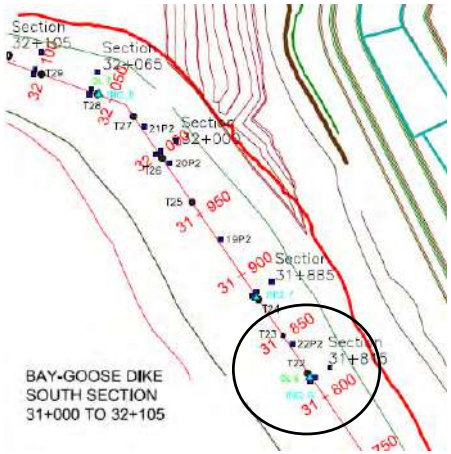


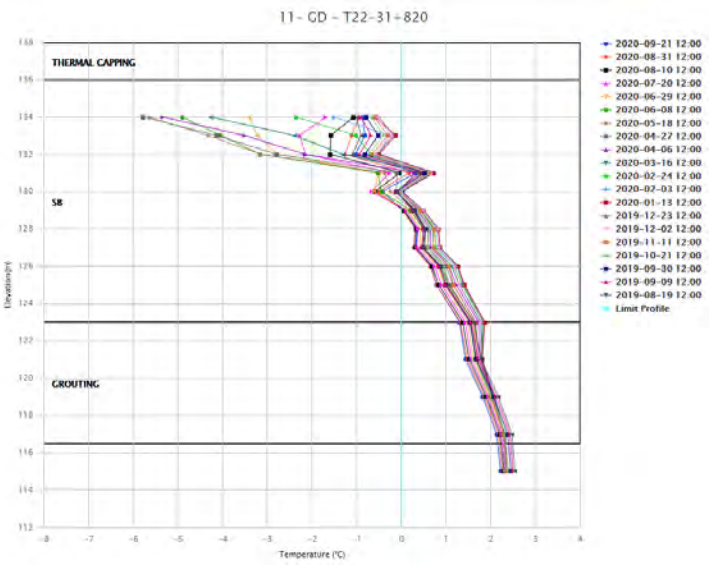


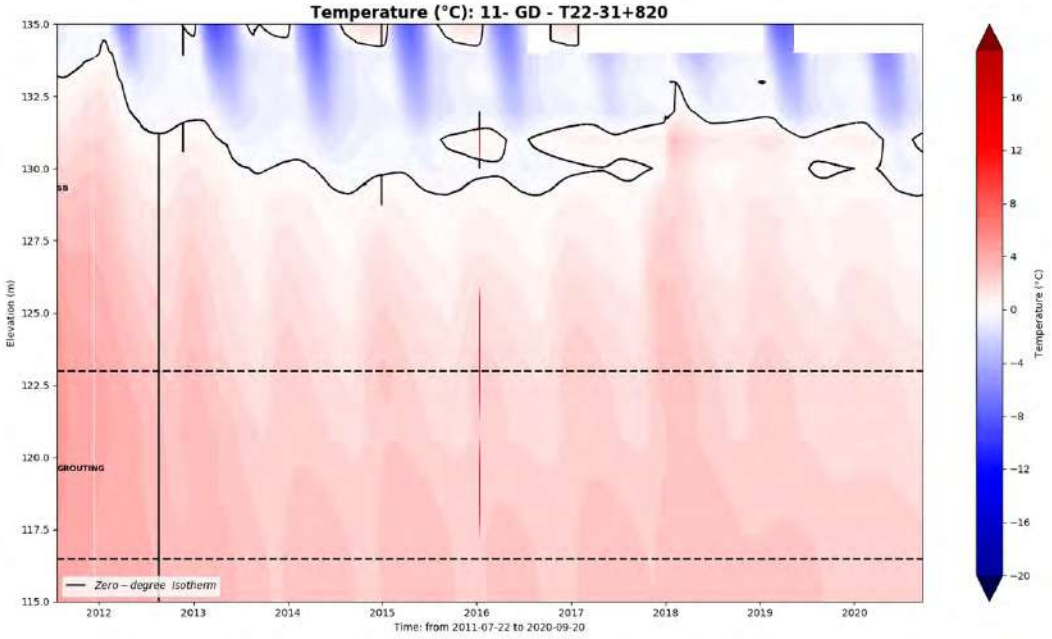


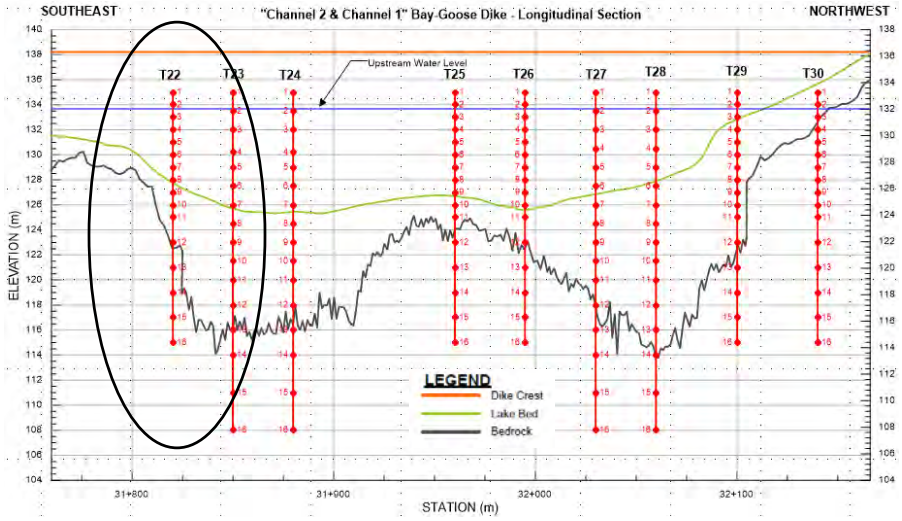


Bay Goose Dike TH22

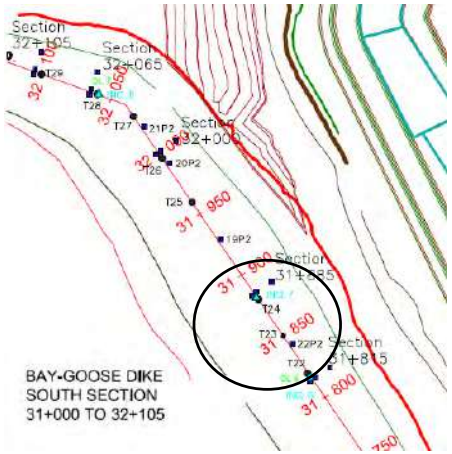


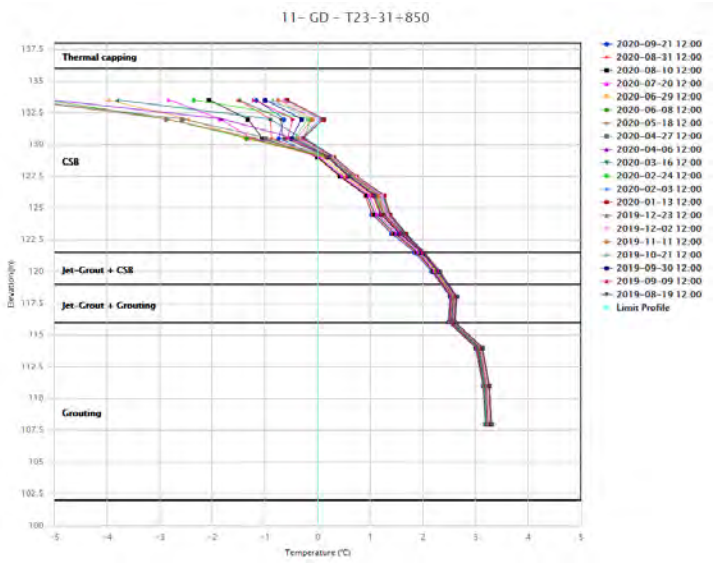


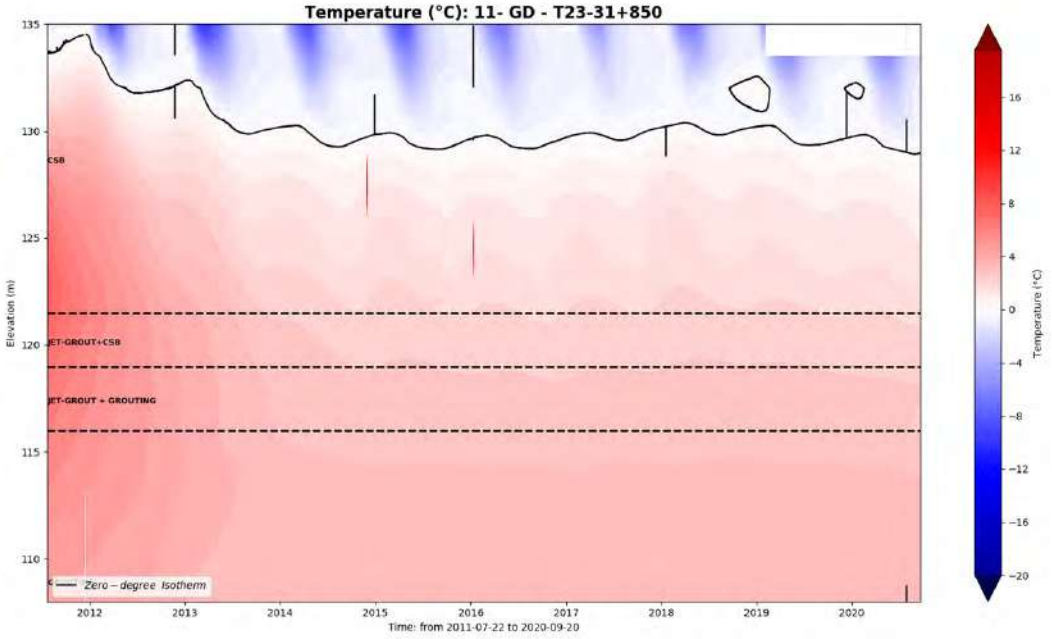


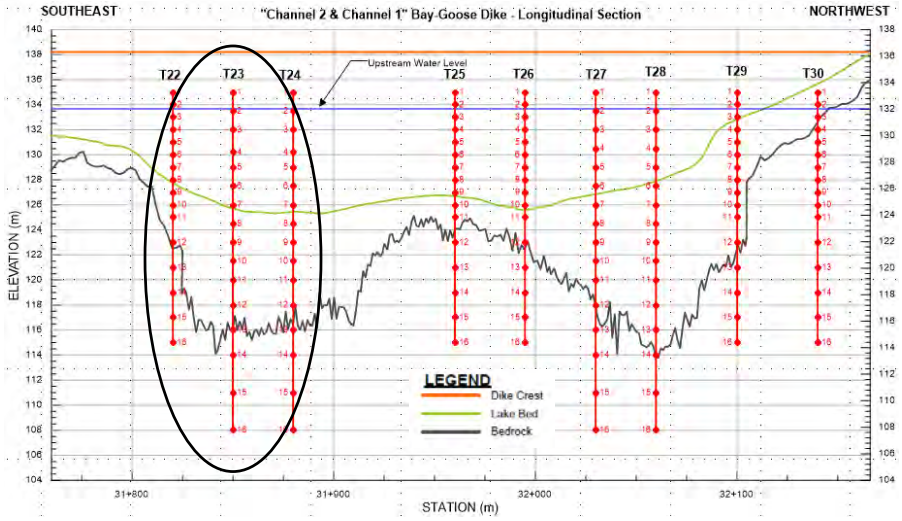


Bay Goose Dike TH23

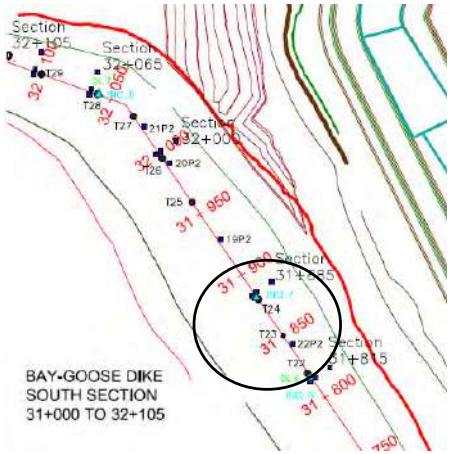


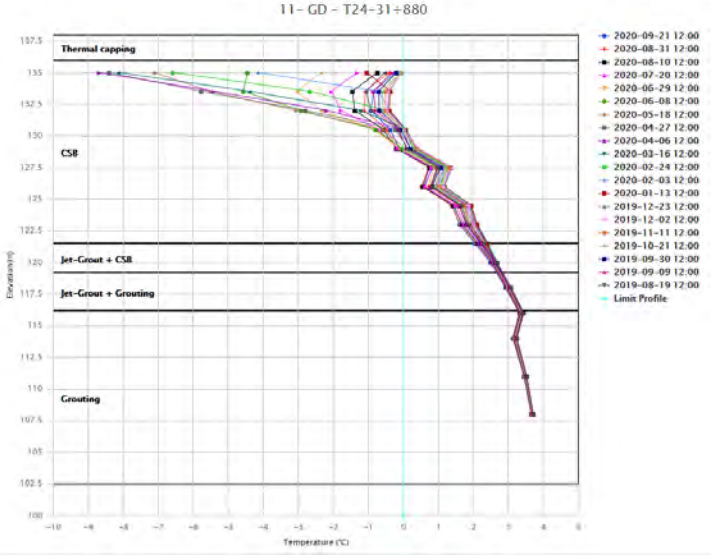


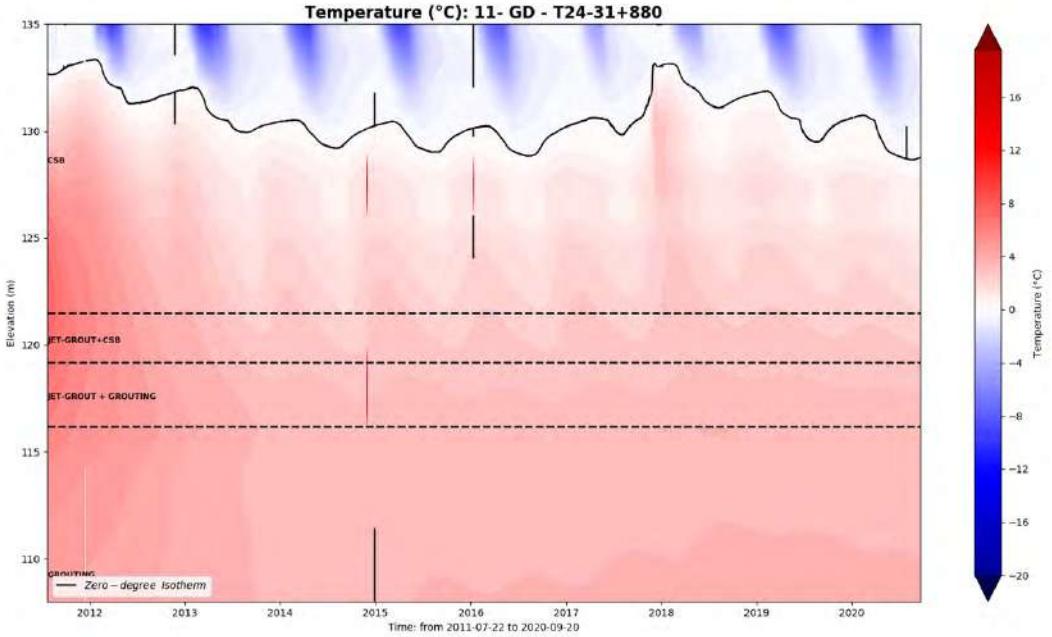


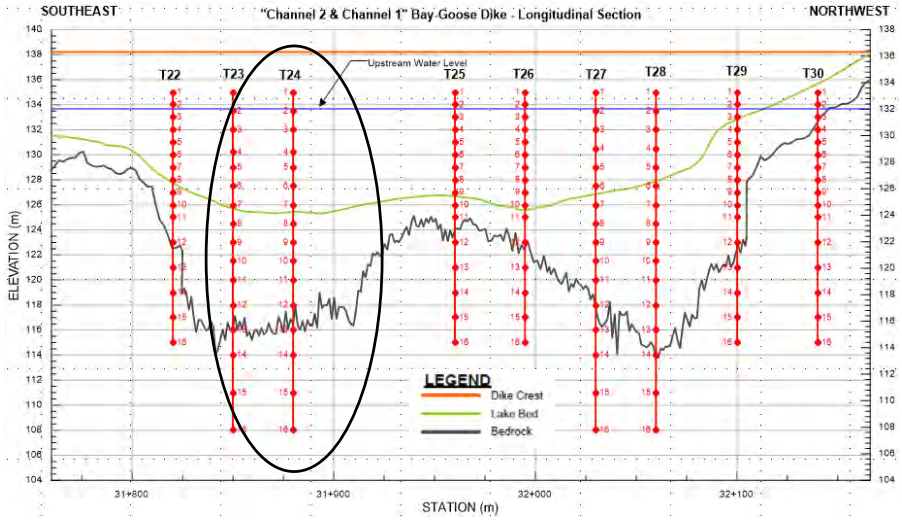


Bay Goose Dike TH24

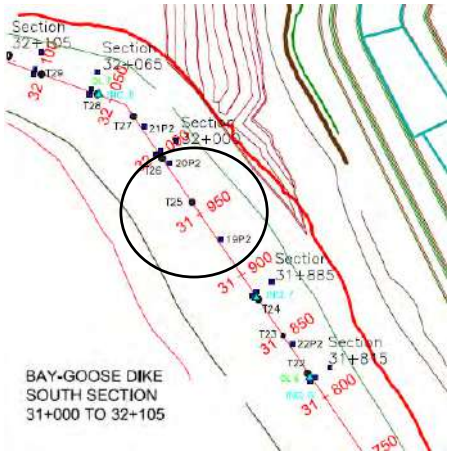


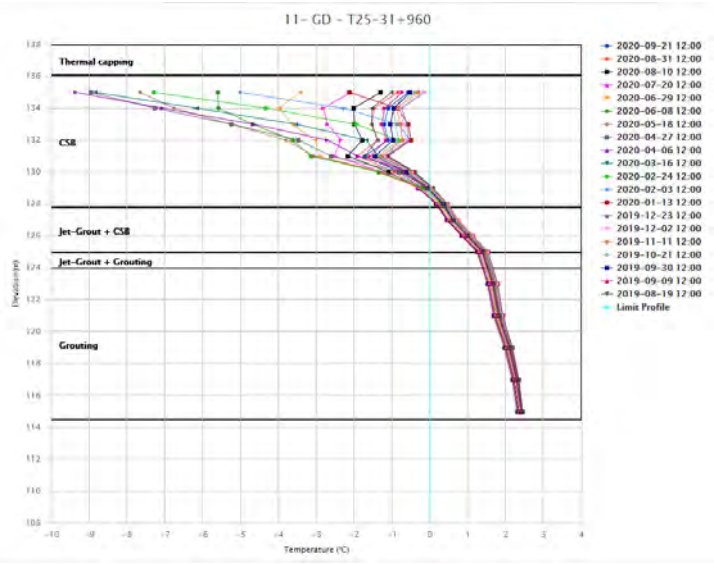


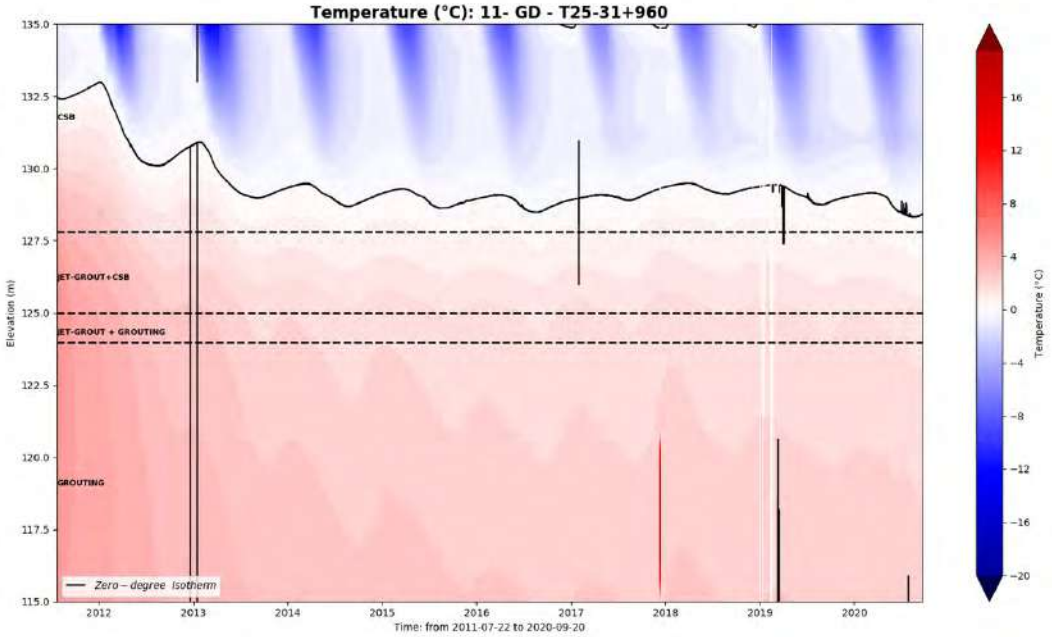


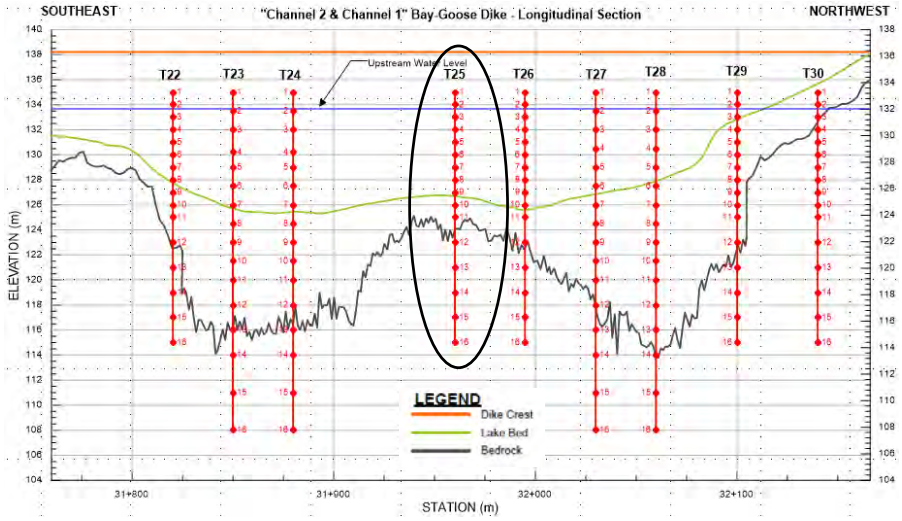


Bay Goose Dike TH25

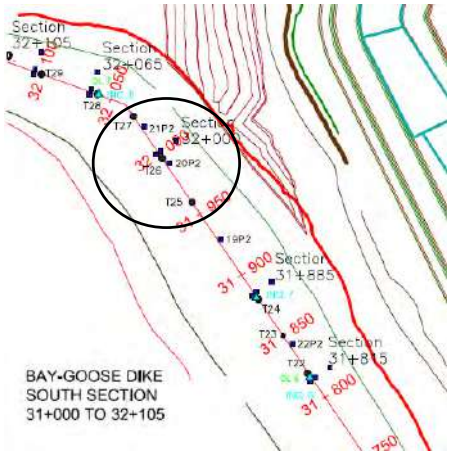


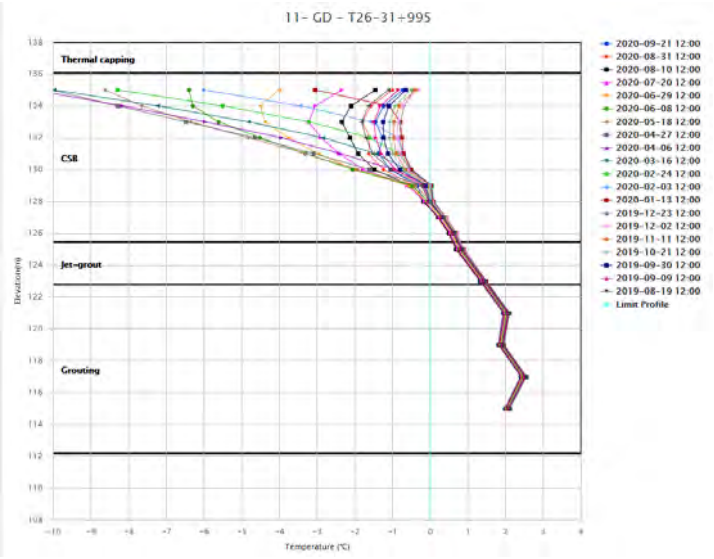


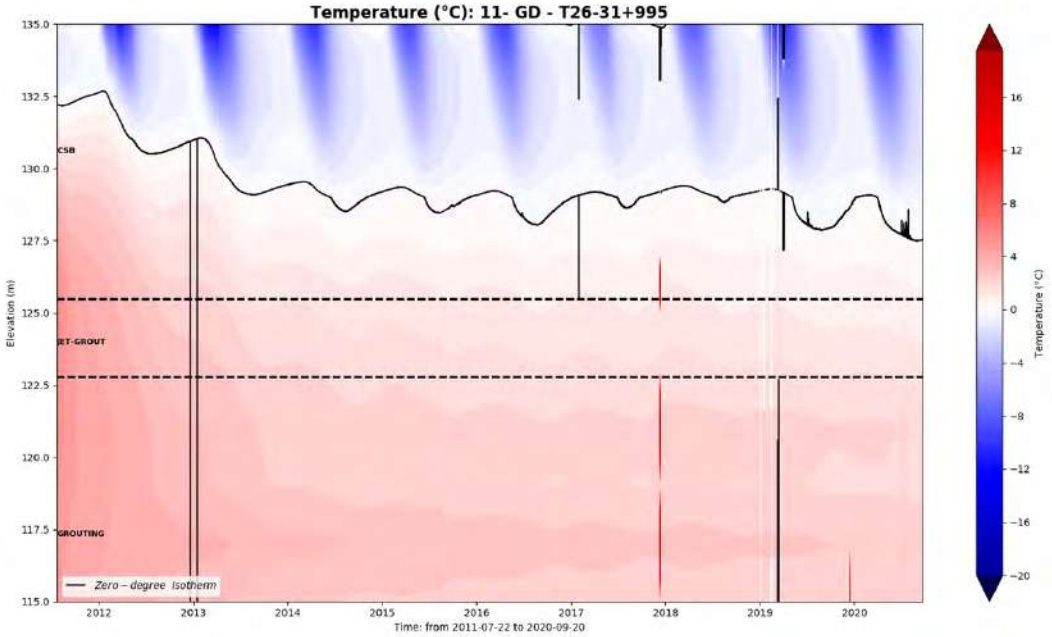


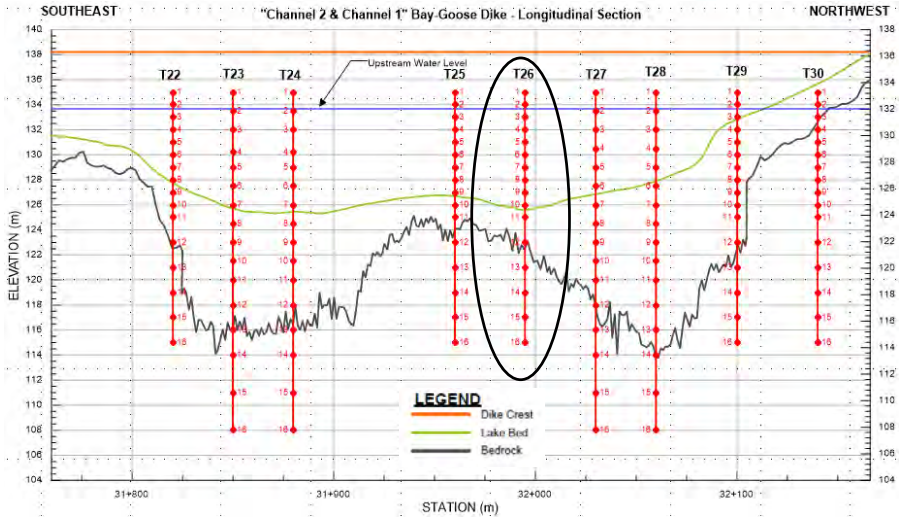


Bay Goose Dike TH26

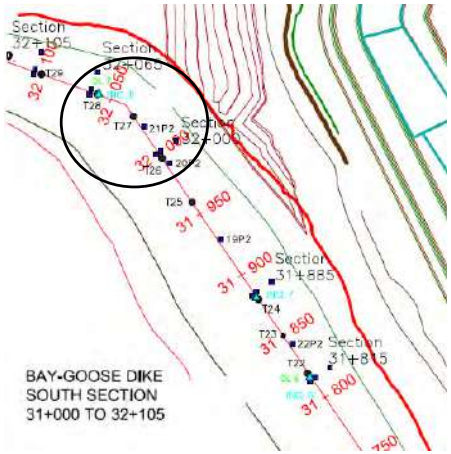


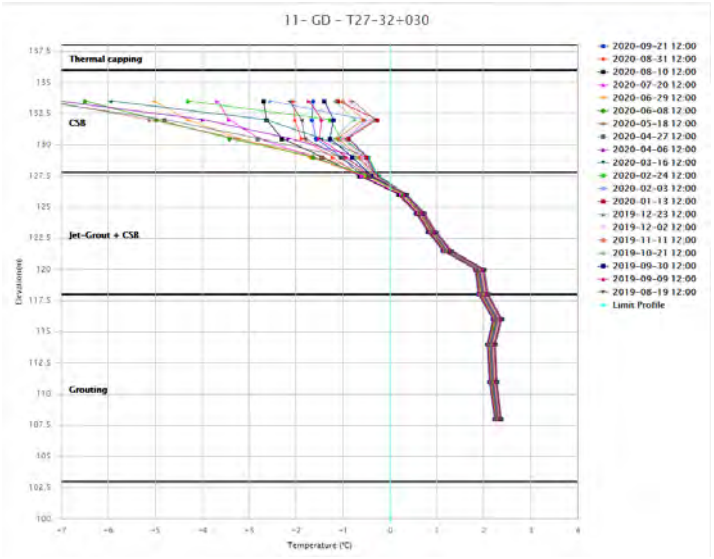


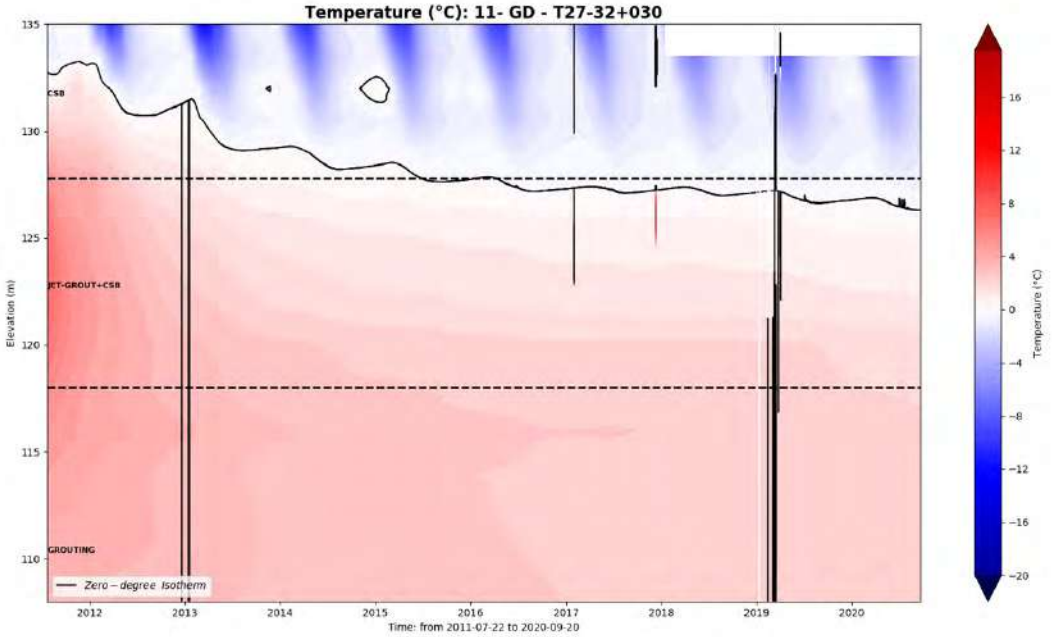


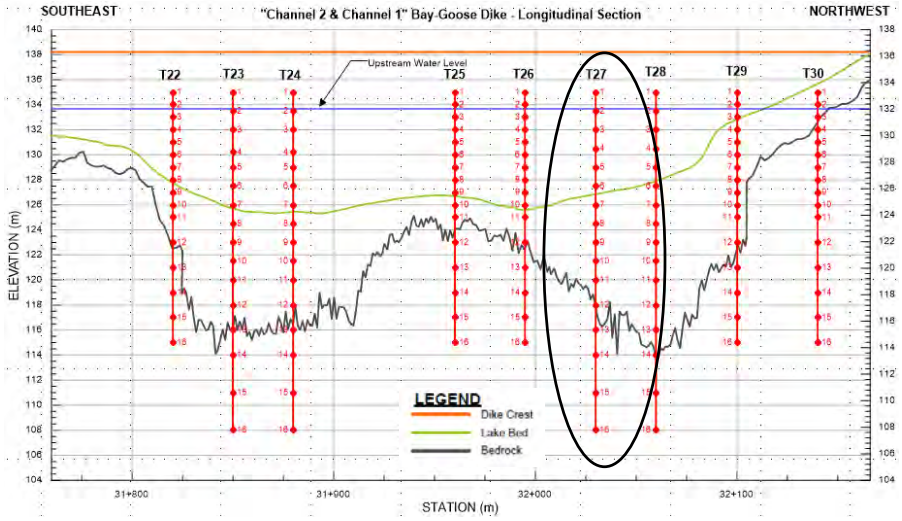


Bay Goose Dike TH27

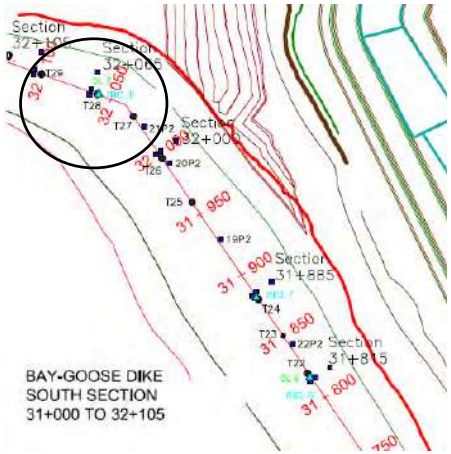


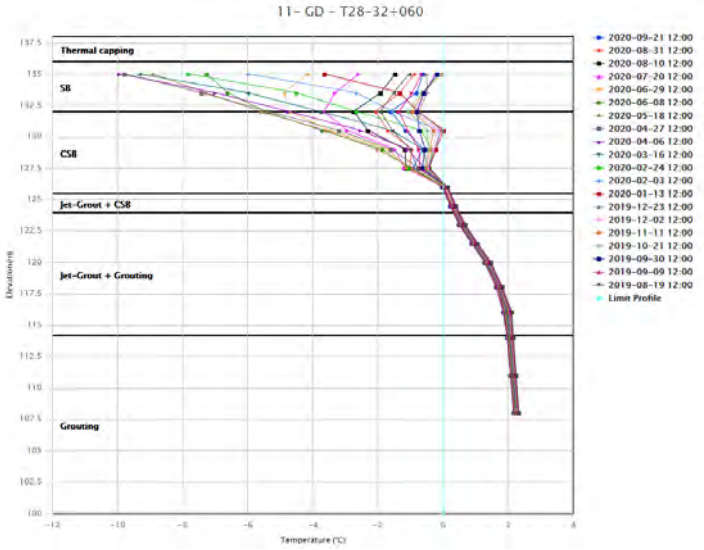


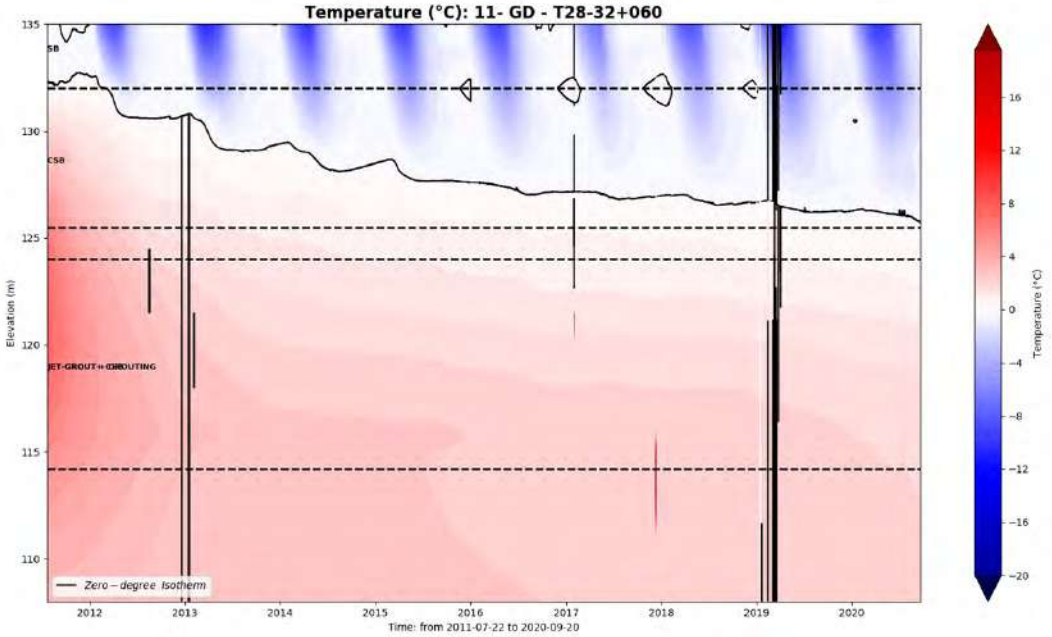


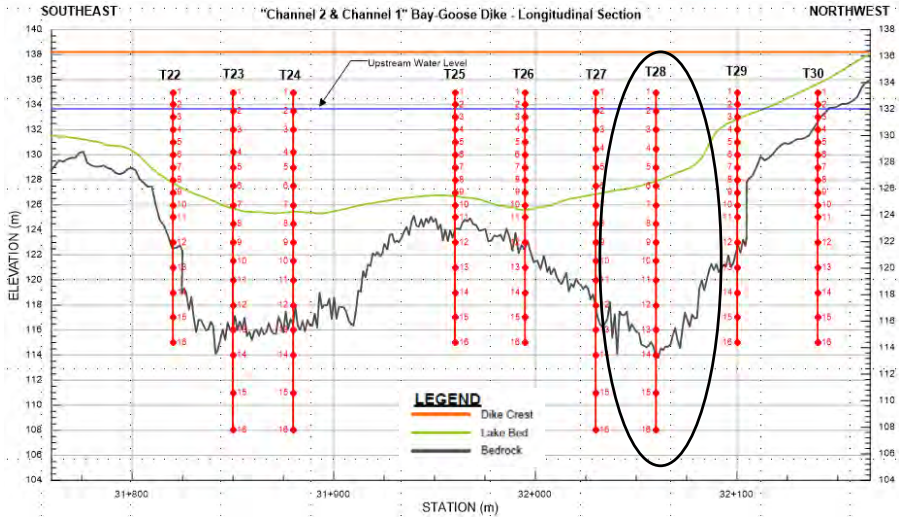


Bay Goose Dike TH28

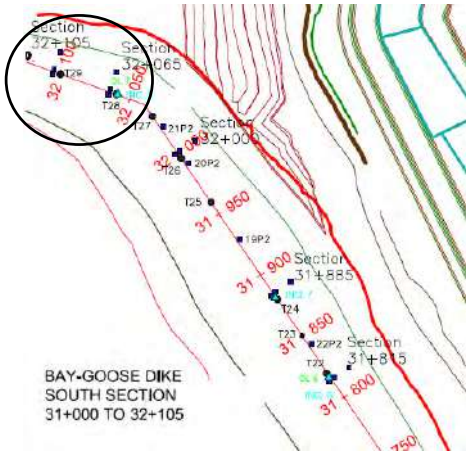


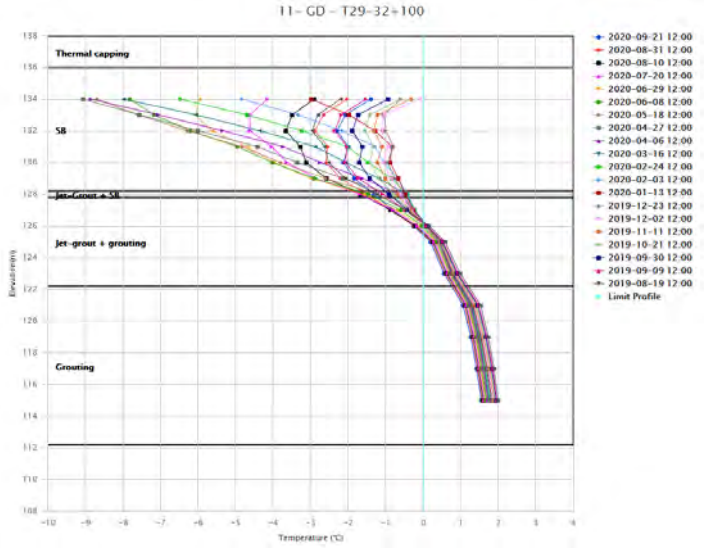


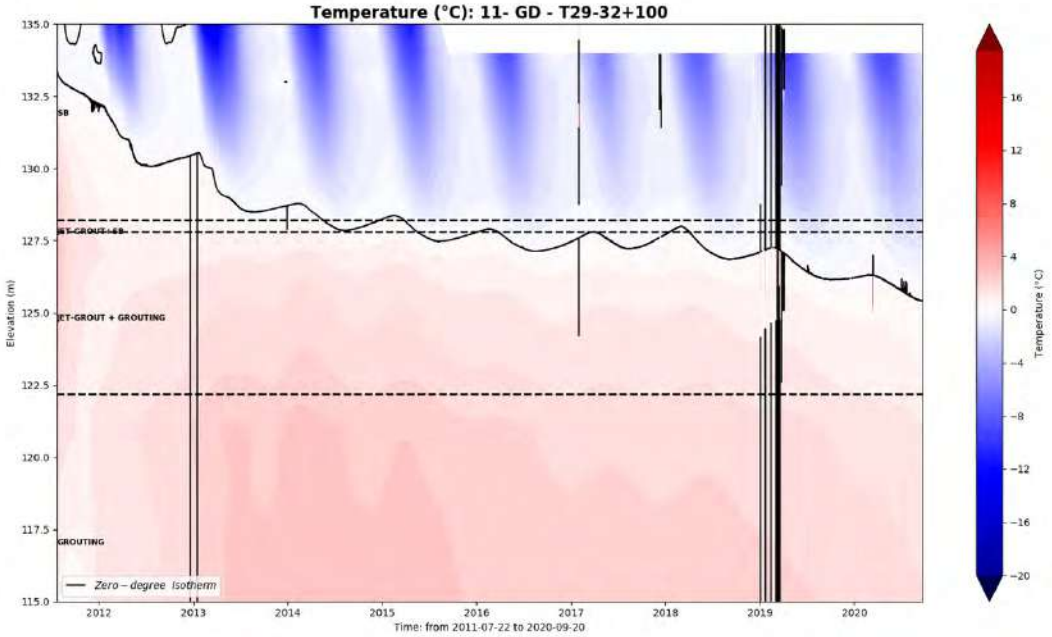


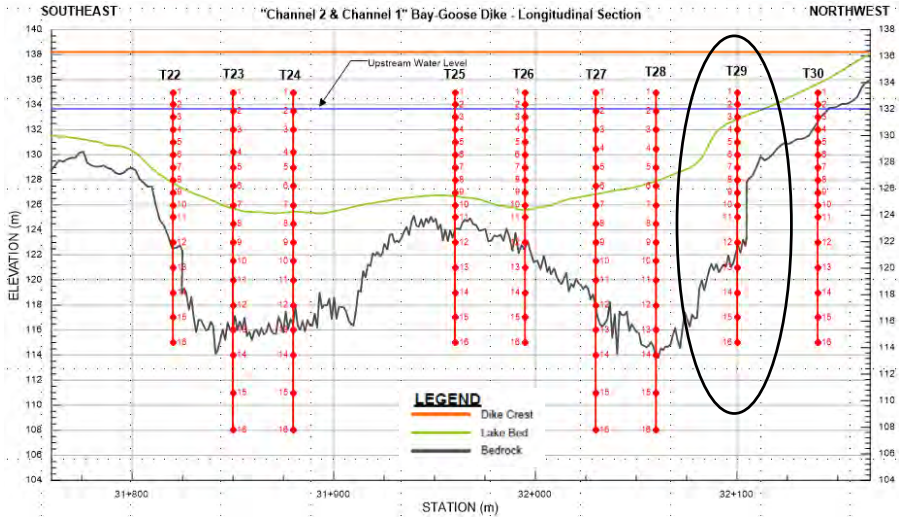


Bay Goose Dike TH29

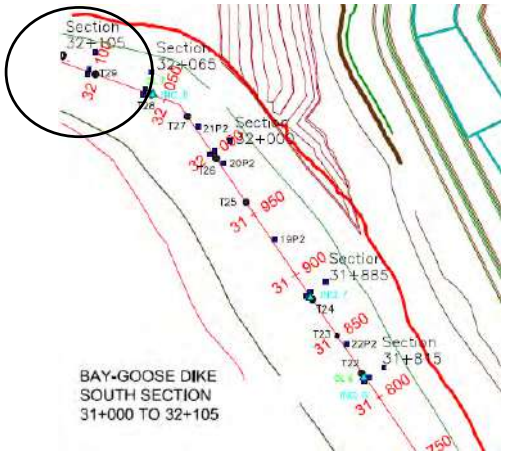


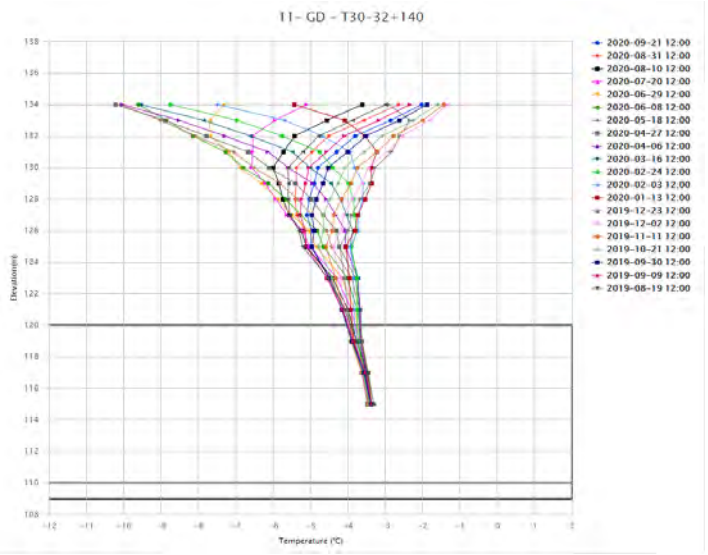


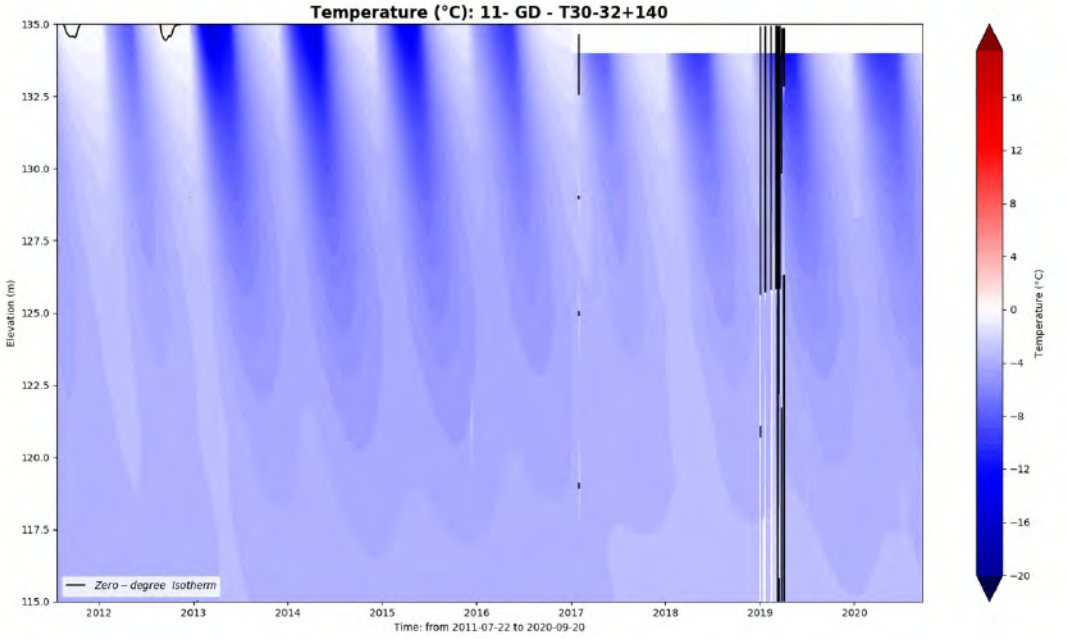


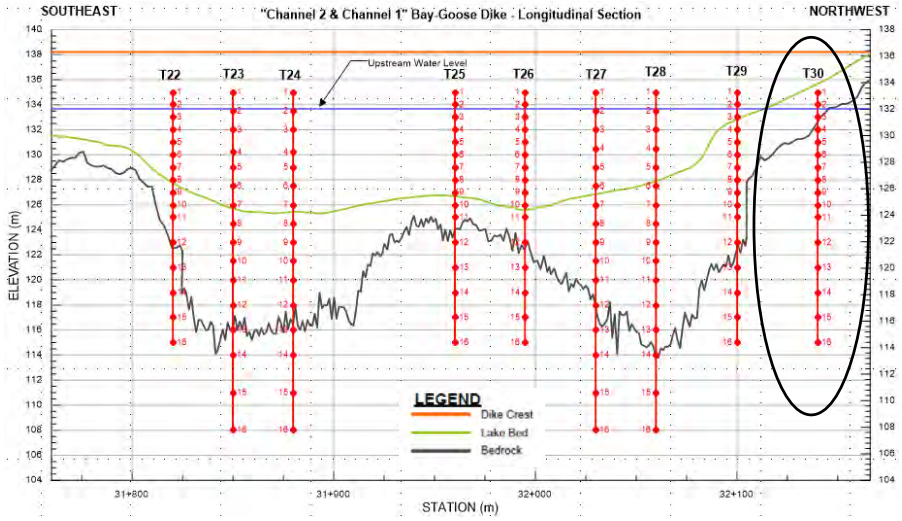


Bay Goose Dike TH30

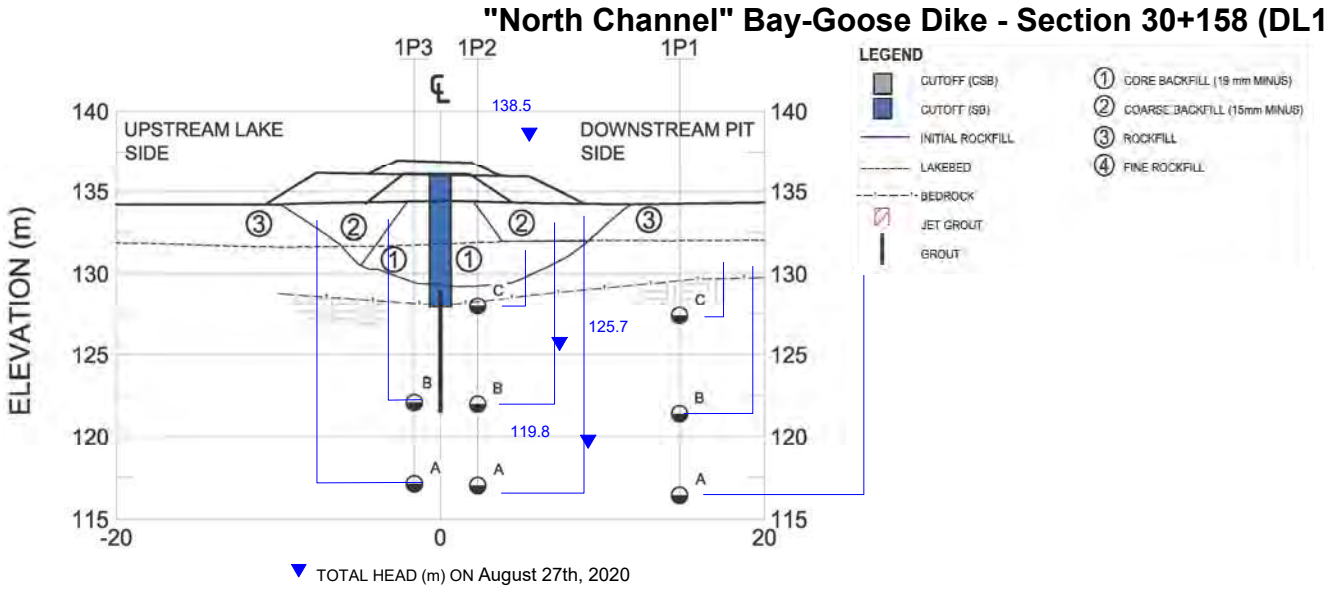


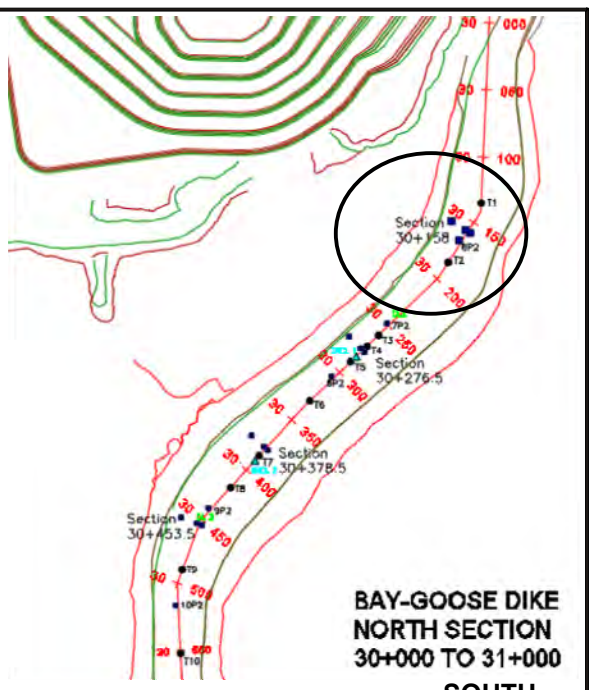




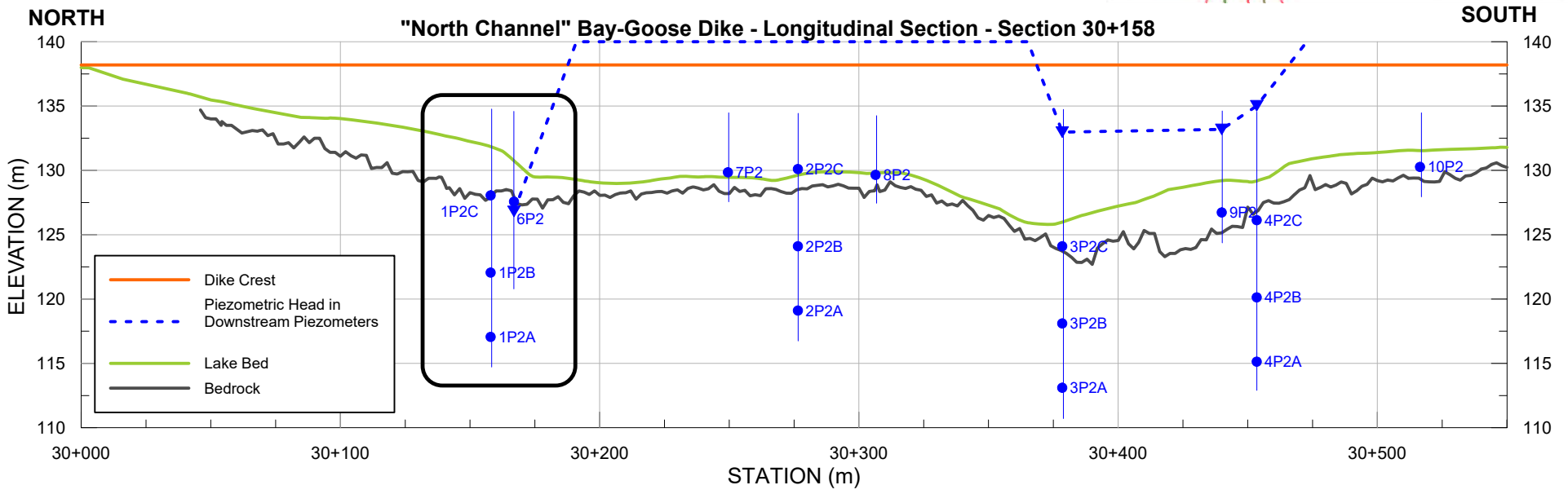


"North Channel" Bay-Goose Dike - Section 30+158 (DL1)

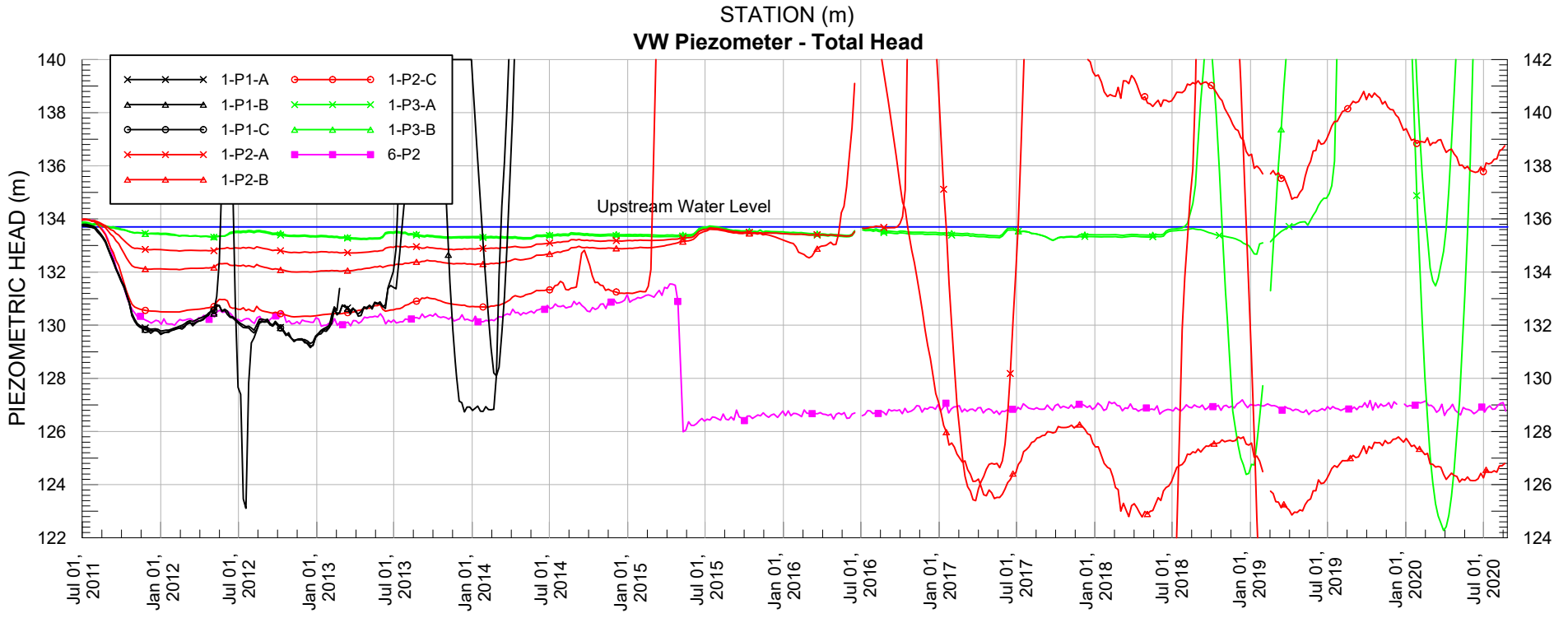




"North Channel" Bay-Goose Dike - Longitudinal Section - Section 30+158



VW Piezometer - Total Head



VW Piezometer - Temperature

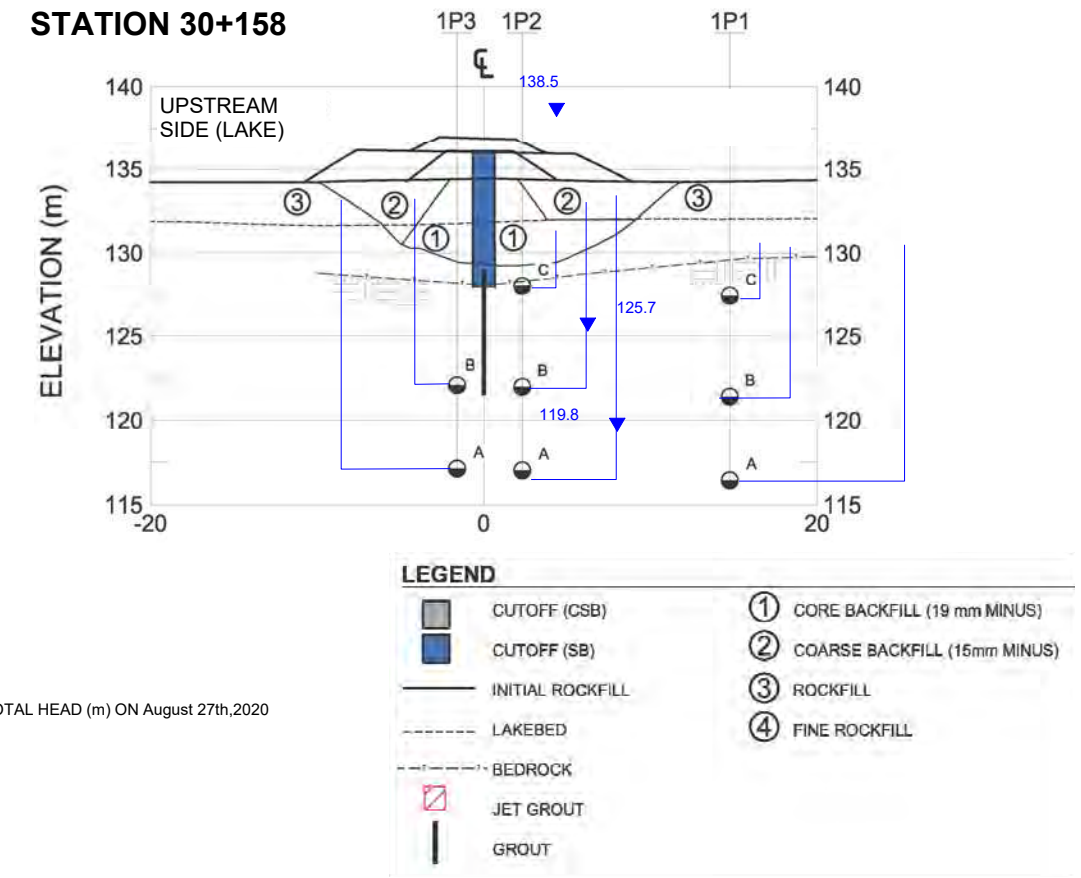
NOTES:

1. 1-P1-A, 1-P2-B,1-P1-C, 1-P2-C and 6P2 are assumed to been frozen and not giving good data. The PWP not considered reliable. Any data should be interpreted with caution.

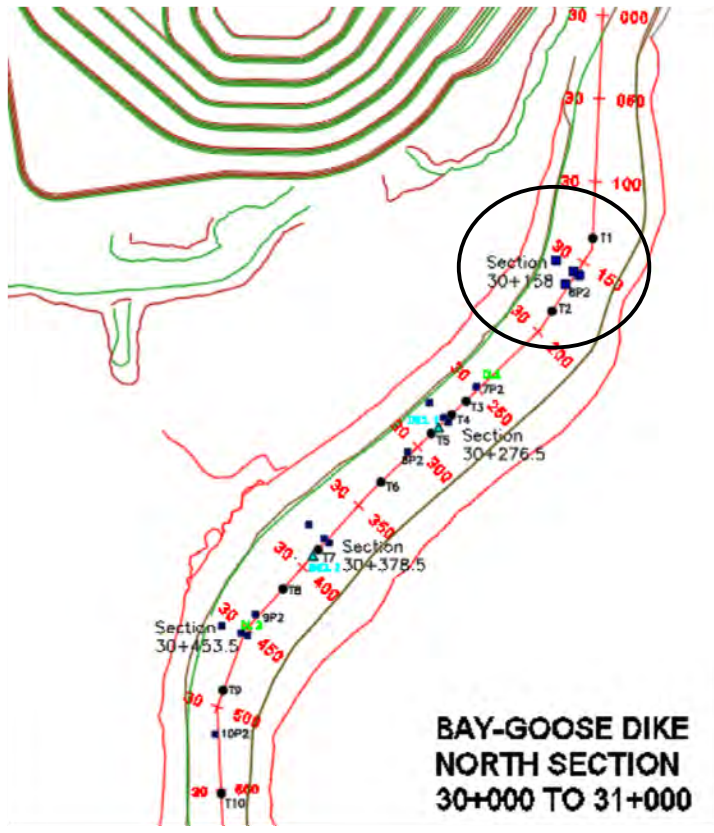
PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE Section 30+158 - PIEZOMETRIC DATA (July 1/11 to Aug 27/20)

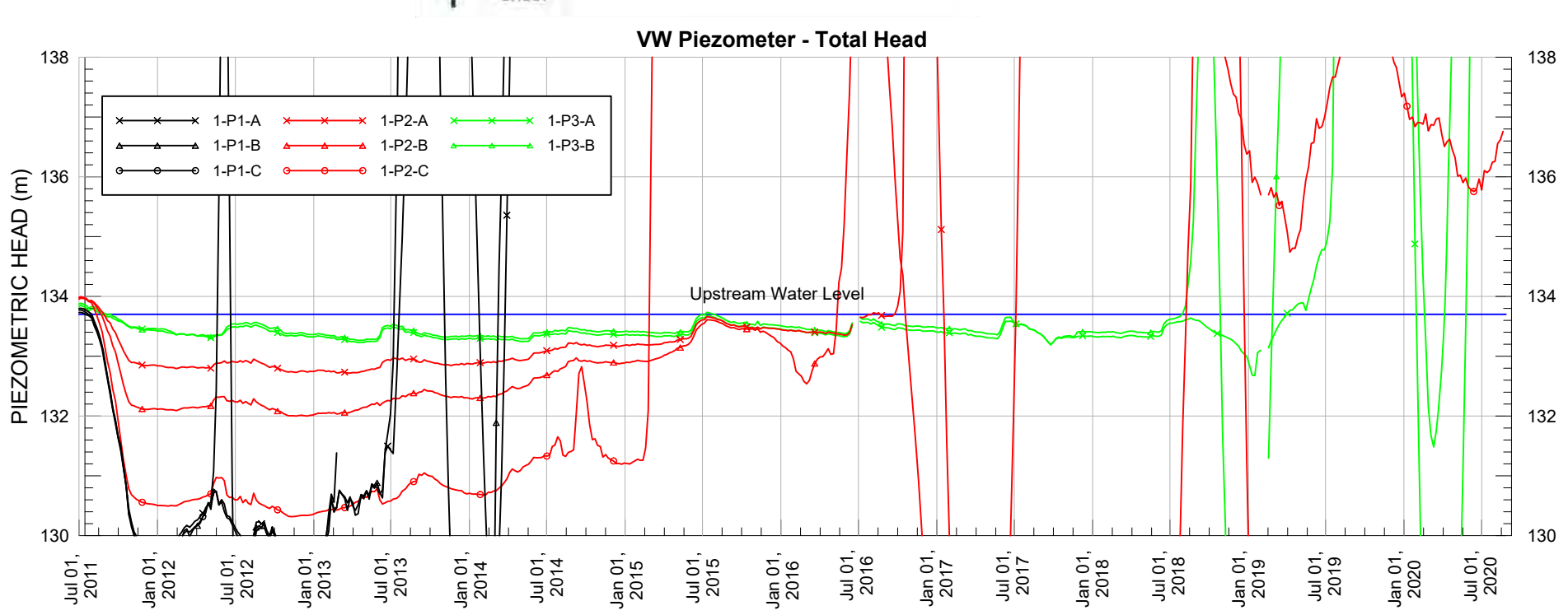
AGNICO EAGLE MEADOWBANK

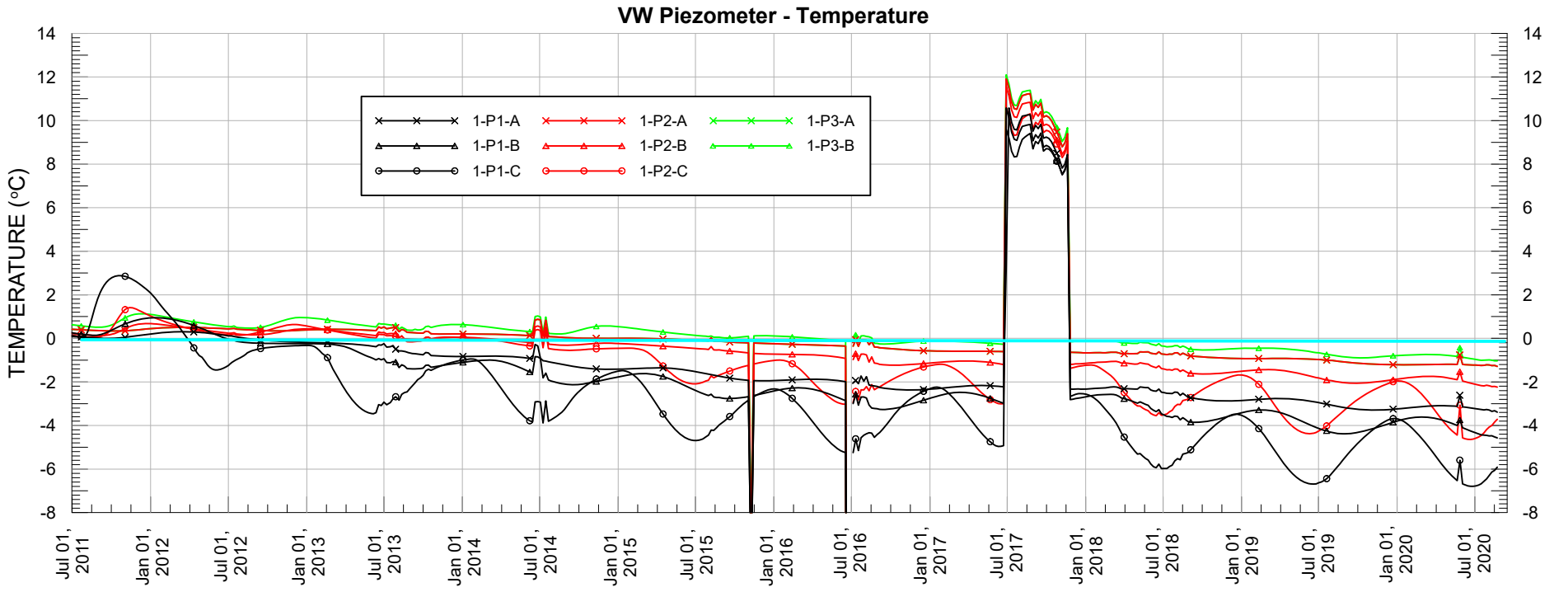
PROJECT No.			PHASE No.	
DESIGN	TD	30/8/14	SCALE AS SHOWN	REV.
CADD	TD	30/8/14	FIGURE 1	
CHECK	PG	31/8/14		
REVIEW				



▼ TOTAL HEAD (m) ON August 27th,2020







NOTES:

1. 1-P1-A, 1-P2-B,1-P1-C, 1-P2-A and 6P2 are assumed to been frozen and not giving good data. The PWP not considered to be reliable data.

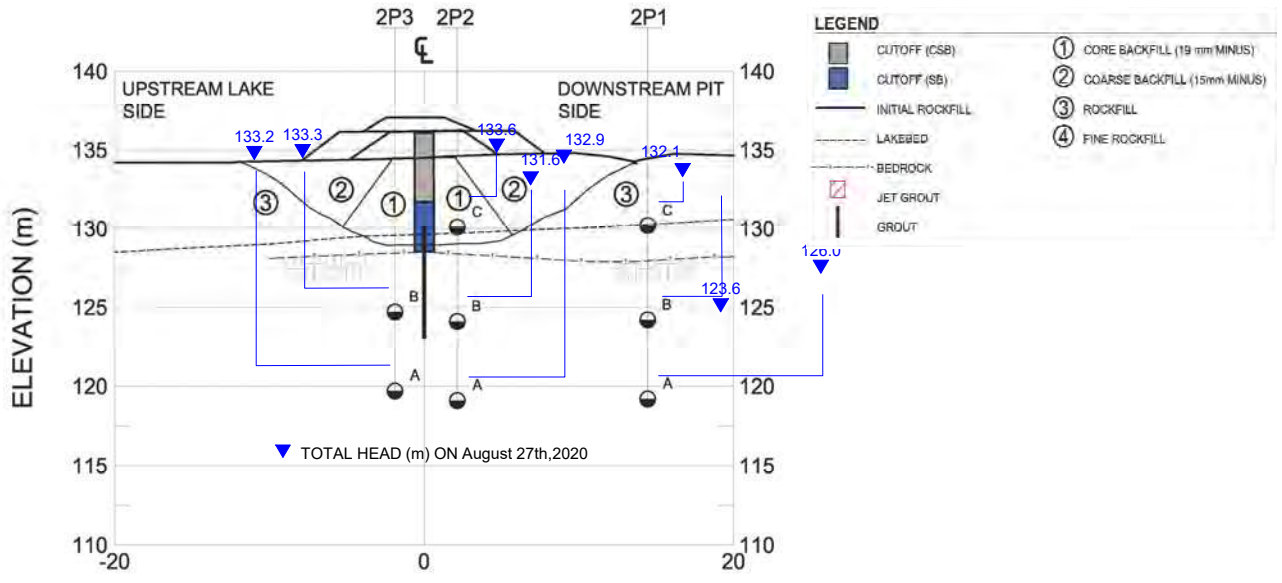
PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE - SECTION 30+158 PIEZOMETRIC DATA (July 1/11 to Aug 27/20)

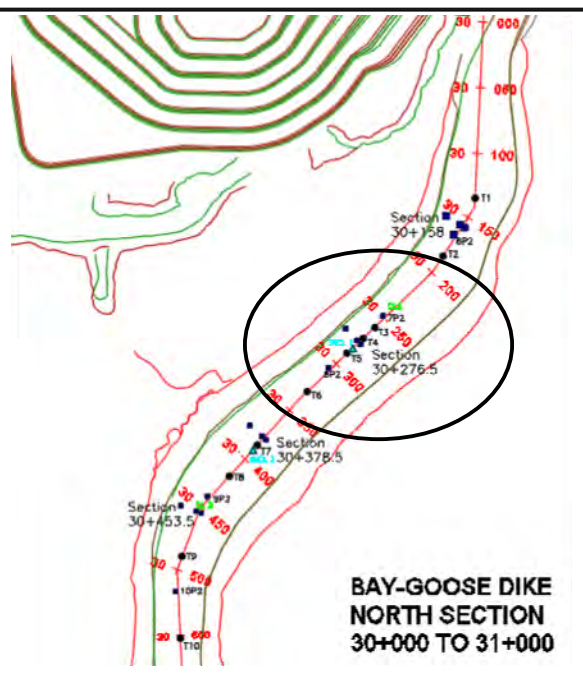
AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	31AUG14	SCALE AS SHOWN	REV.
CADD	TD	31AUG14		
CHECK	PG	28AUG14		
REVIEW				

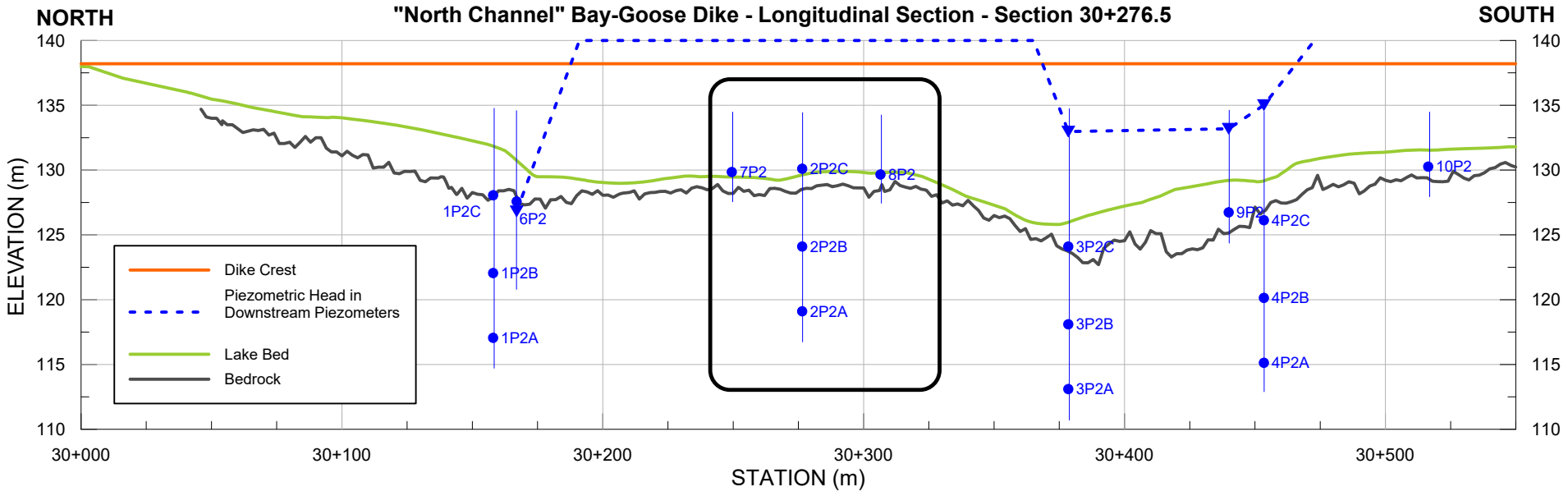
FIGURE 2

"North Channel" Bay-Goose Dike - Section 30+276.5 (DL1)

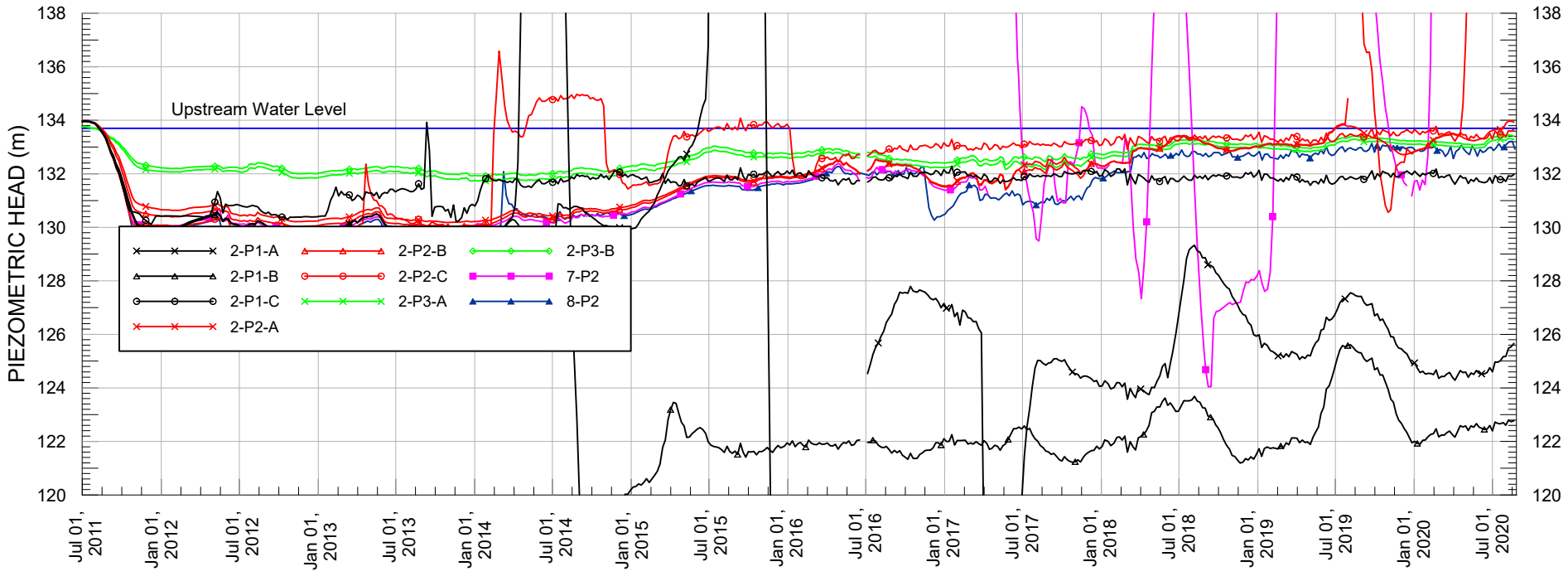




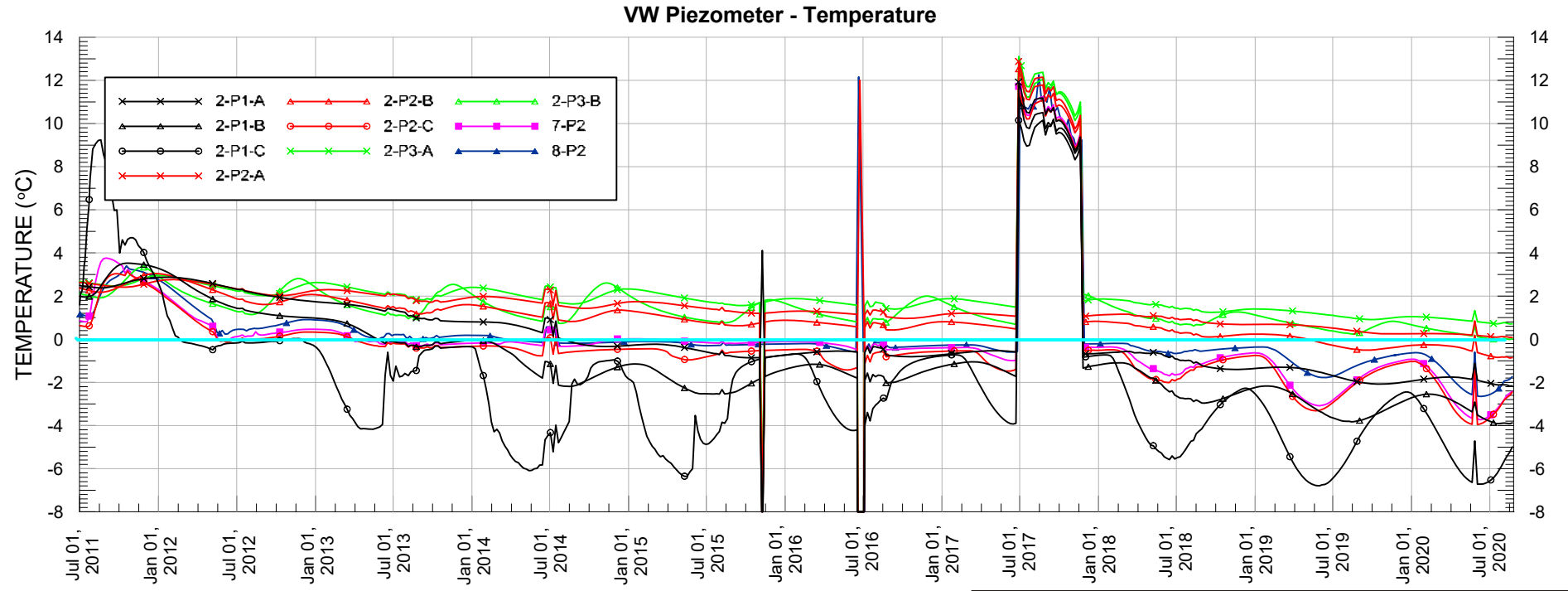
"North Channel" Bay-Goose Dike - Longitudinal Section - Section 30+276.5



VW Piezometer - Total Head



VW Piezometer - Temperature



NOTES:
1: 2P1A, 2P1B and 2P2C are assumed to be frozen. 7P2 and 8P2 are also considered frozen therefore the data is considered not reliable as the previous trend shows.

PROJECT: **AGNICO EAGLE MINES LIMITED**
MEADOWBANK GOLD PROJECT
NUNAVUT

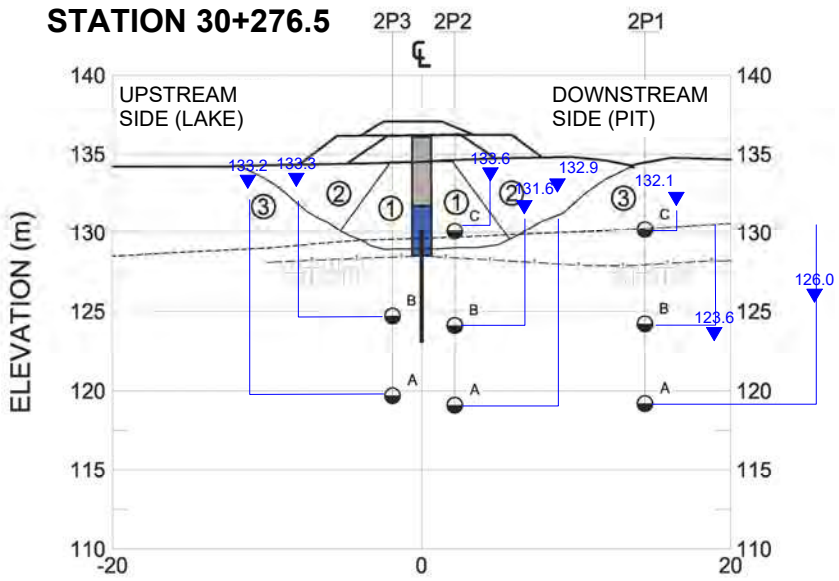
TITLE: **BAYGOOSE DIKE**
Section 30+276.5 - PIEZOMETRIC DATA
(July 1/11 to Aug 27/20)

AGNICO EAGLE MEADOWBANK

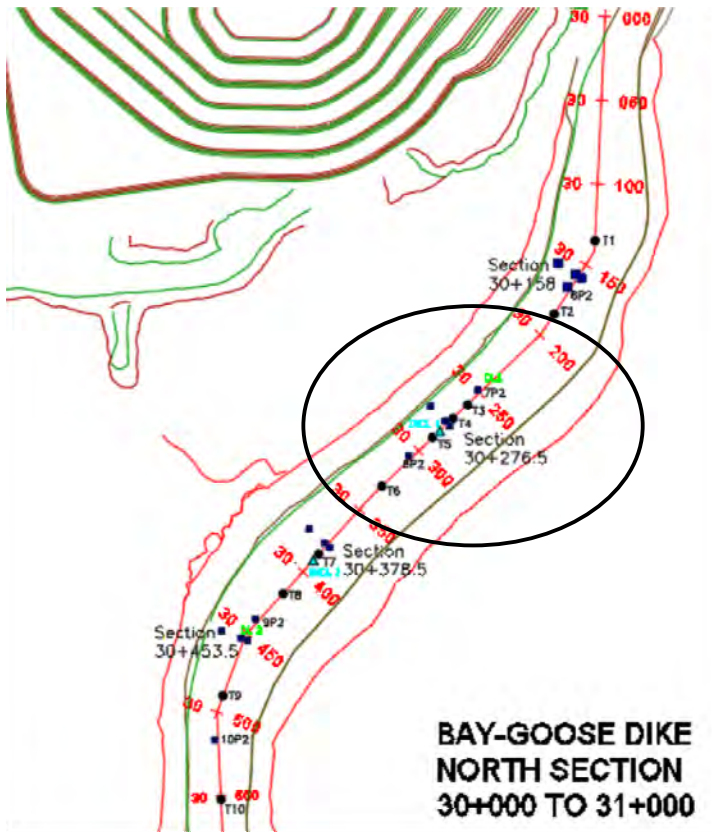
PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14		
REVIEW				

FIGURE 3

STATION 30+276.5

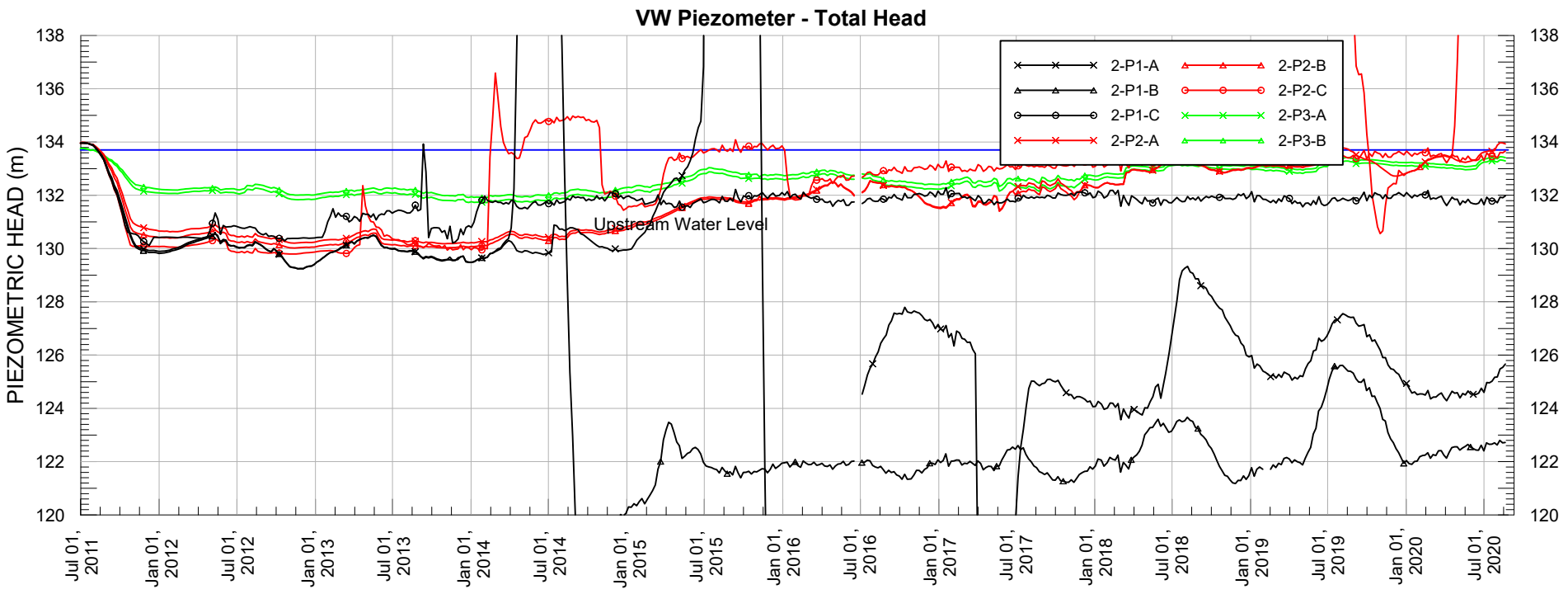


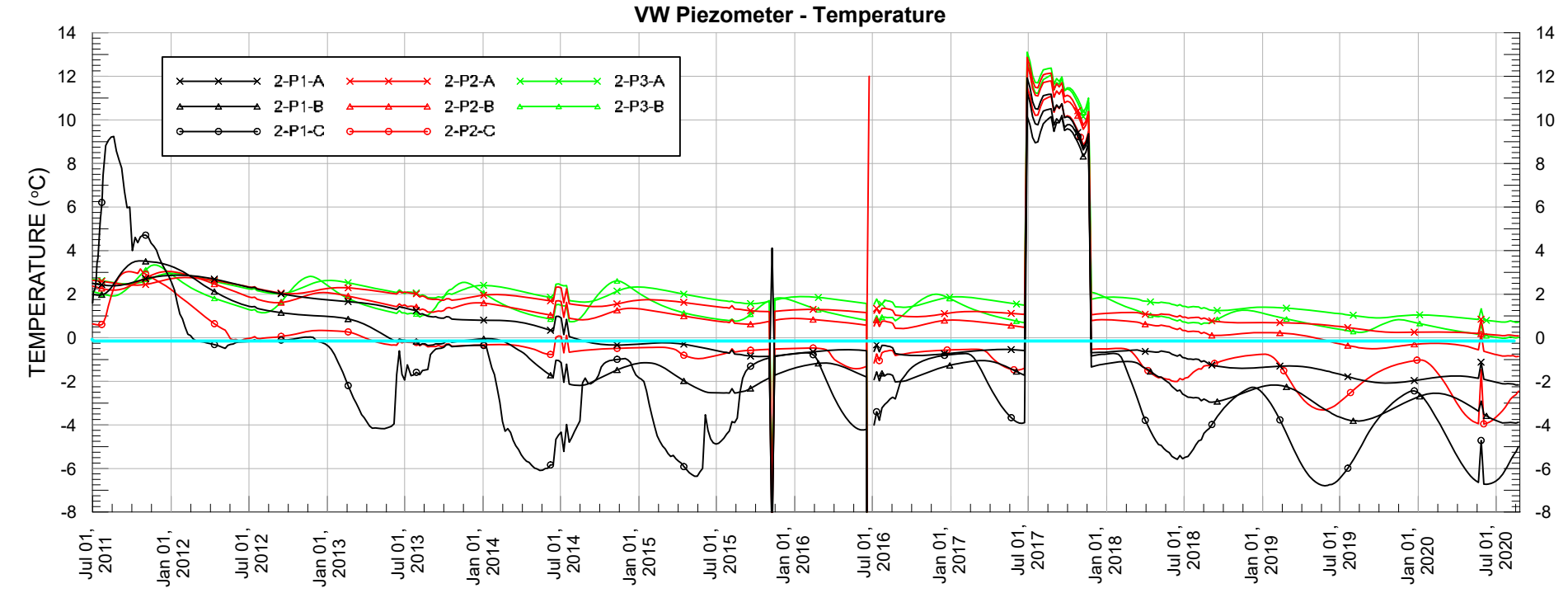
▼ TOTAL HEAD (m) ON August 27th,2020



LEGEND

- CUTOFF (CSB)
- CUTOFF (SB)
- INITIAL ROCKFILL
- LAKEBED
- BEDROCK
- JET GROUT
- GROUT
- ① CORE BACKFILL (19 mm MINUS)
- ② COARSE BACKFILL (15mm MINUS)
- ③ ROCKFILL
- ④ FINE ROCKFILL





NOTES:

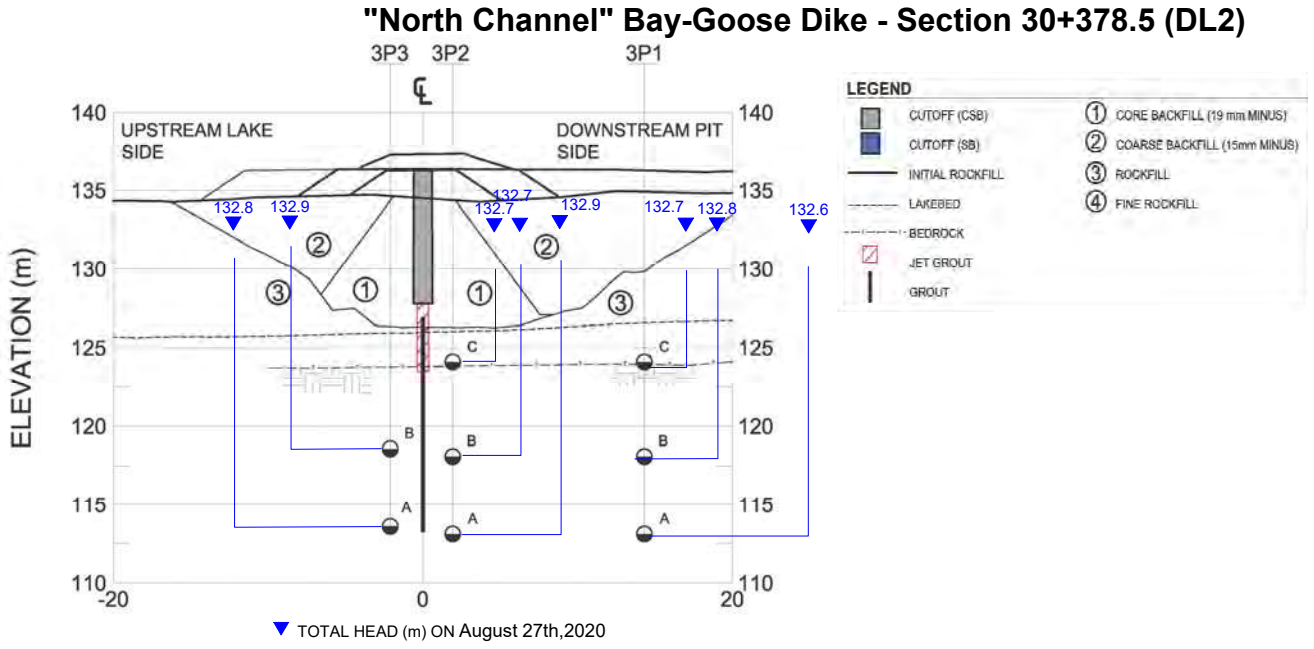
1. 2P1A, 2P1B and 2P2C are assumed to be frozen. 7P2 is also frozen therefore the instrument is not giving reliable data.

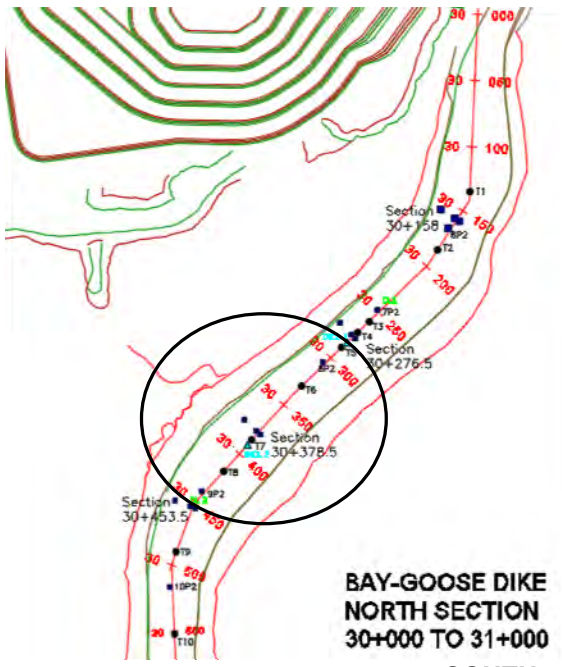
PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAY GOOSE DIKE - SECTION 30+276.5 PIEZOMETRIC DATA (July 1/11 to Aug 27/20)

AGNICO EAGLE MEADOWBANK

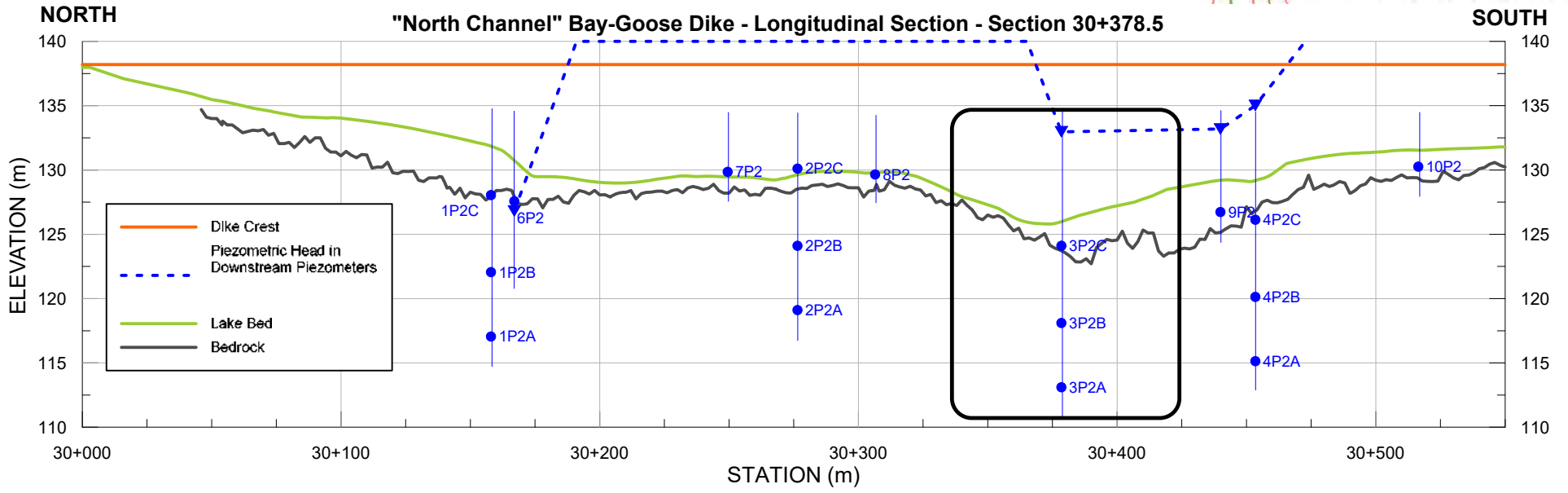
PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	Figure 4	
REVIEW				

"North Channel" Bay-Goose Dike - Section 30+378.5 (DL2)

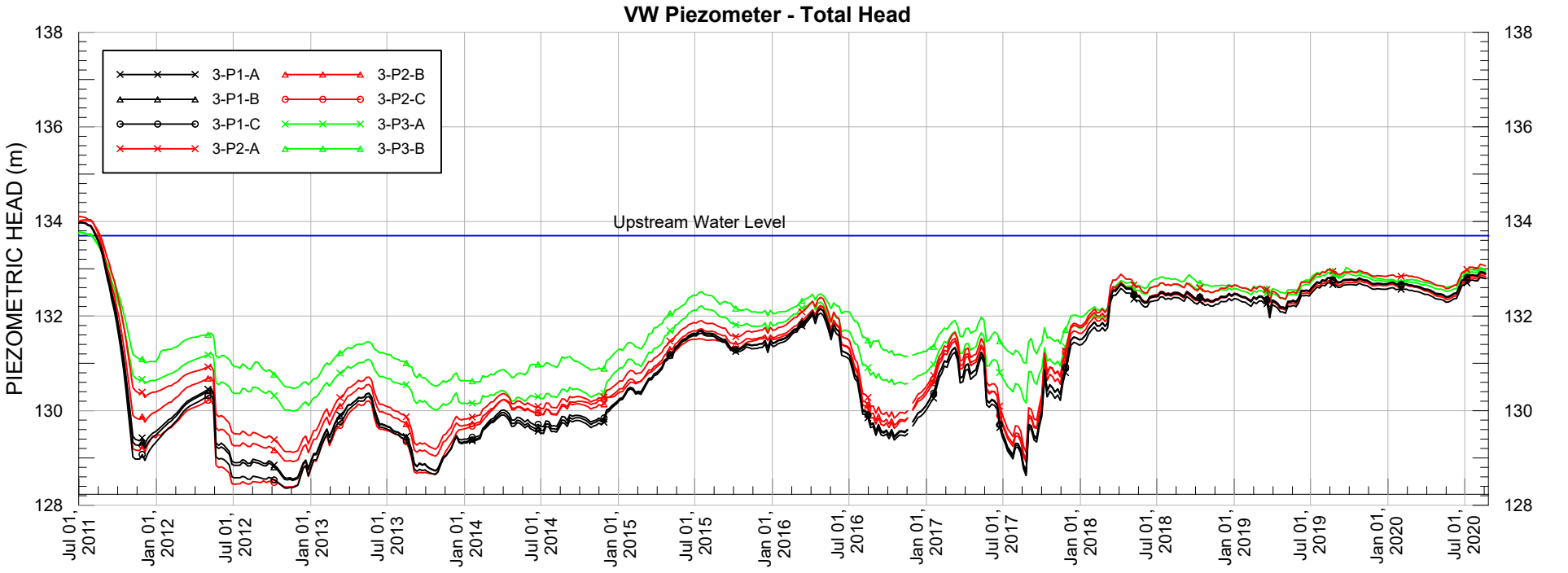




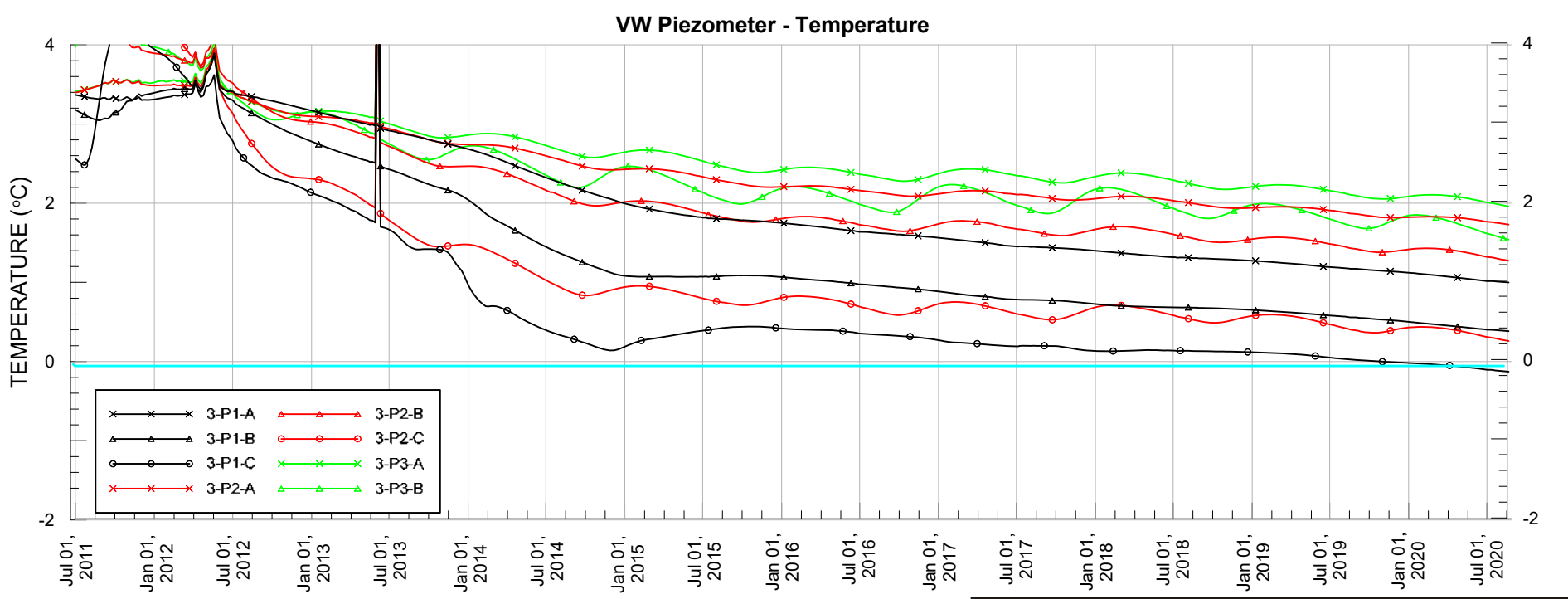
"North Channel" Bay-Goose Dike - Longitudinal Section - Section 30+378.5



VW Piezometer - Total Head



VW Piezometer - Temperature



NOTES:
1. Changes in PWP pressure are directly related to the drill and blasting that is currently ongoing in Portage Pit E5. Ice buildup is also a factor.
2. Mining finished in Pit E on Oct. 26/19.

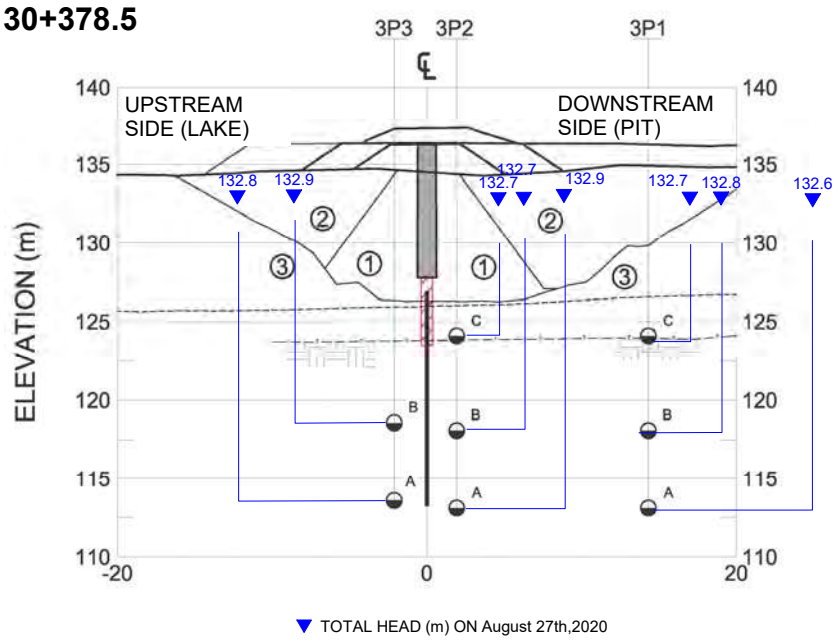
PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

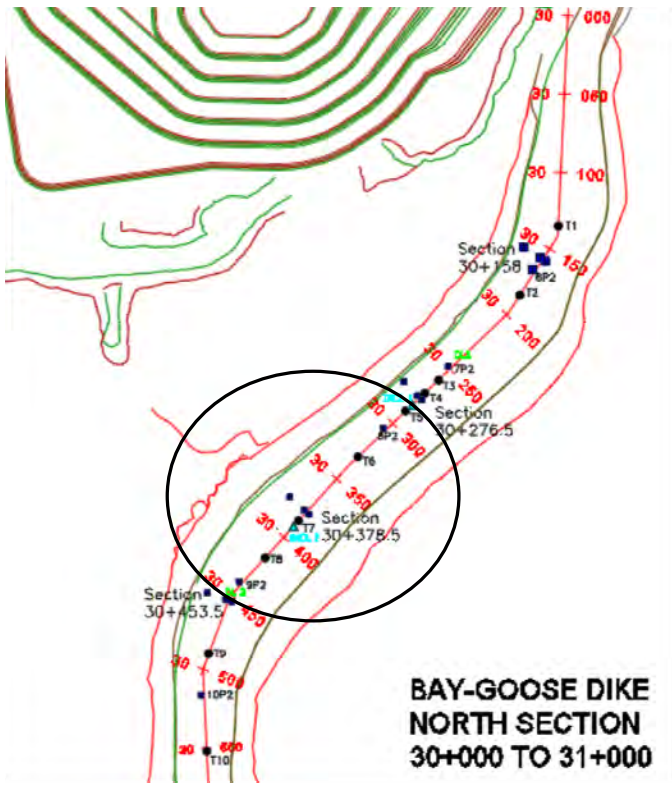
TITLE: BAYGOOSE DIKE
Section 30+378.5 - PIEZOMETRIC DATA
(July 1/11 to Aug 27/20)

AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	FIGURE 5	
REVIEW				

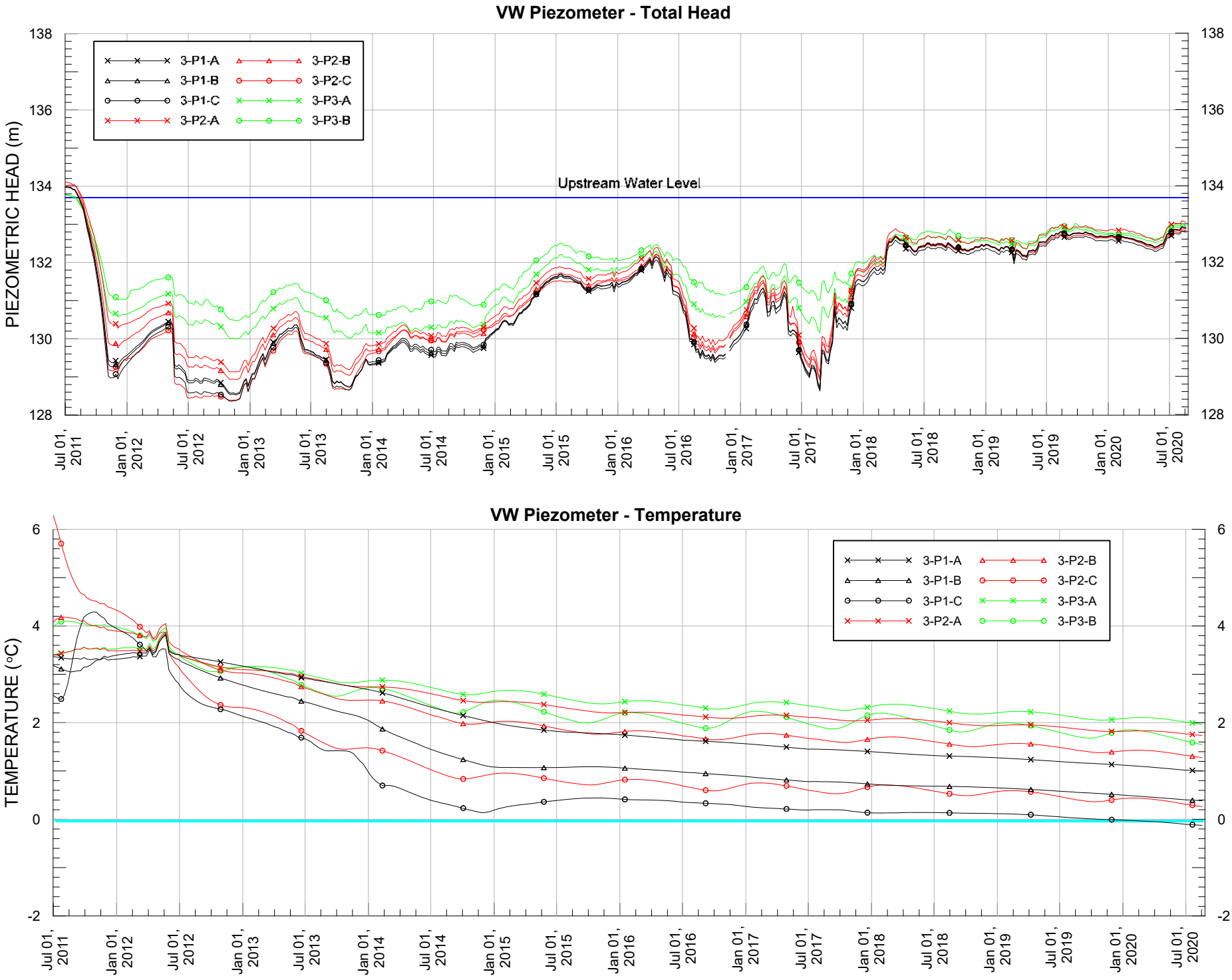
STATION 30+378.5





LEGEND

- CUTOFF (CSB)
- CUTOFF (SB)
- INITIAL ROCKFILL
- LAKEBED
- BEDROCK
- JET GROUT
- GROUT
- ① CORE BACKFILL (19 mm MINUS)
- ② COARSE BACKFILL (15mm MINUS)
- ③ ROCKFILL
- ④ FINE ROCKFILL



NOTES:

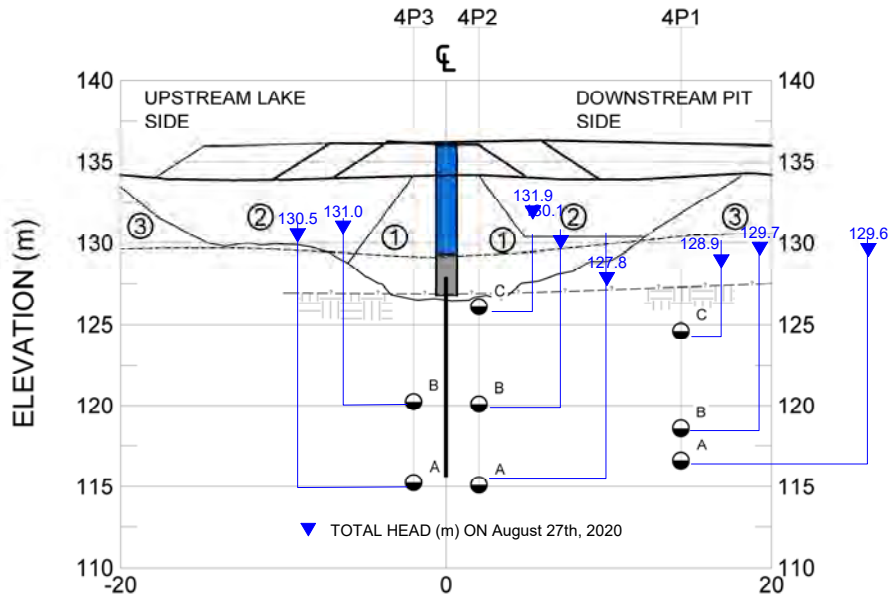
1. Changes in PWP pressure are directly related to the drill and blasting that is currently ongoing in Portage Pit E5. Ice buildup is also a factor.
2. Mining Operations in Pit E finished on Oct. 26/19.

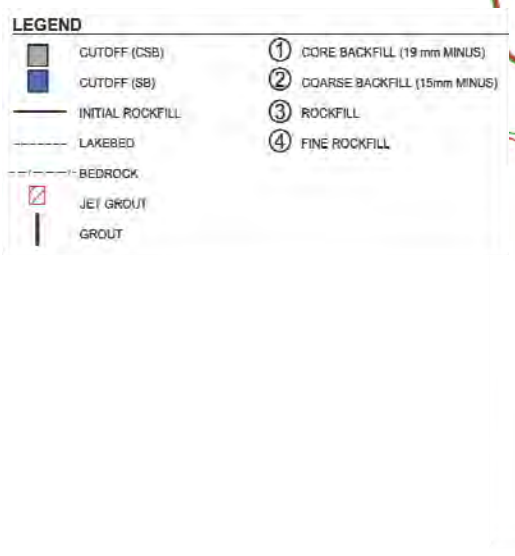
PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE - SECTION 30+378.5 PIEZOMETRIC DATA (July 1/11 to Aug 27/20)

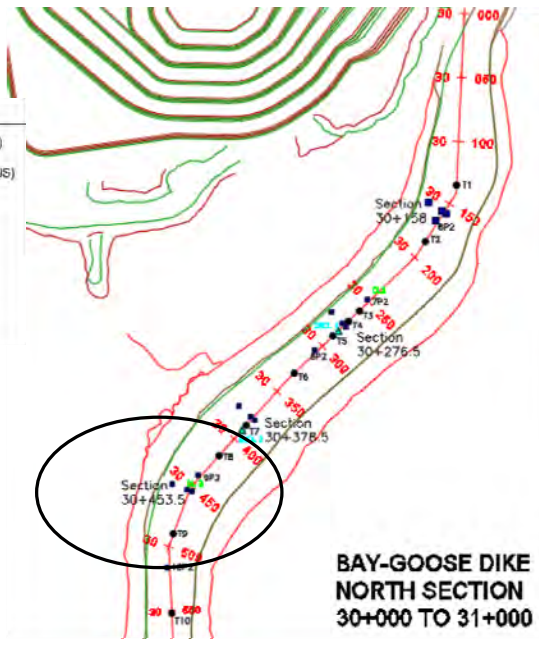
AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.		
DESIGN			SCALE		REV.
CADD	TD	28AUG14	AS SHOWN		
CHECK	TD	28AUG14			
REVIEW	PG	28AUG14	FIGURE 6		

"North Channel" Bay-Goose Dike - Section 30+453.5 (DL2)

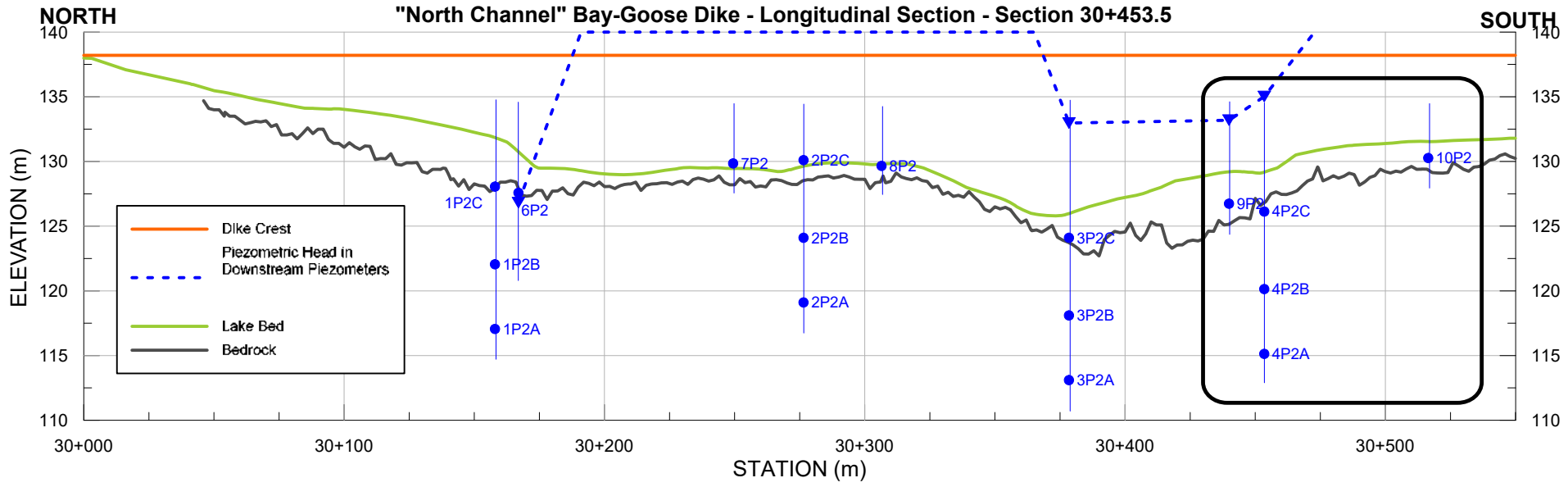




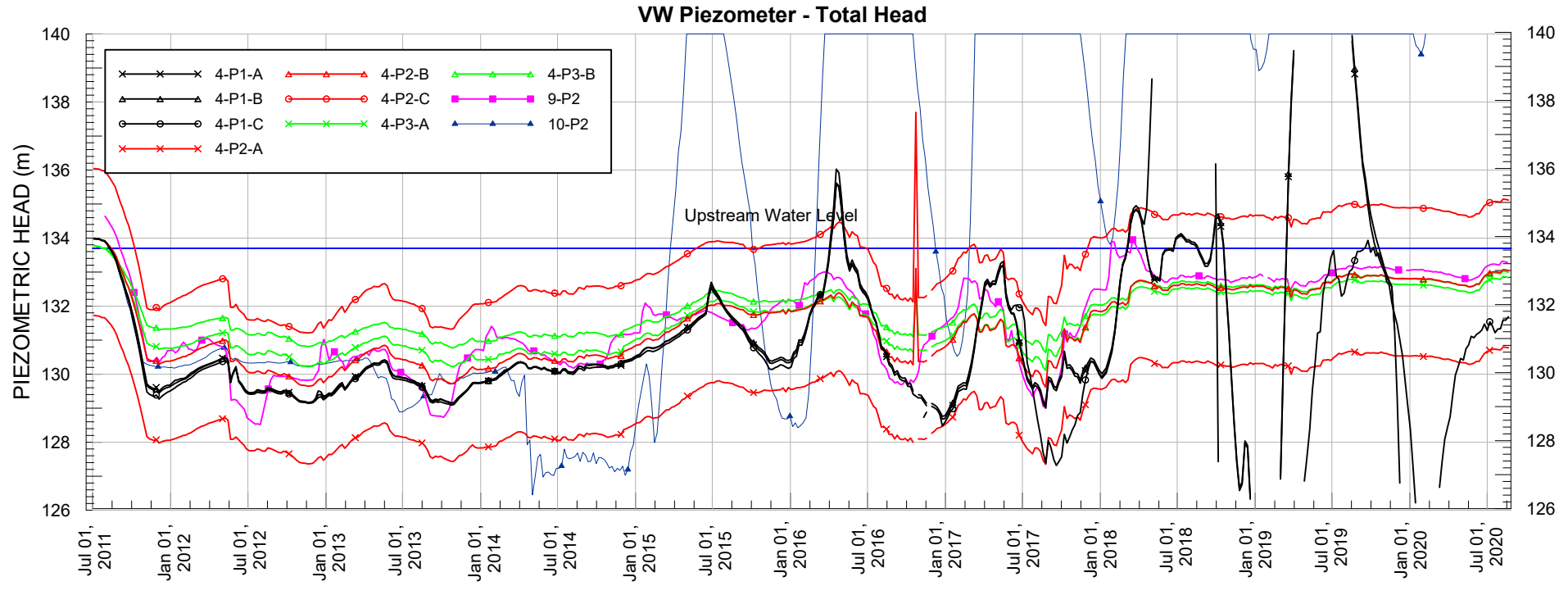


"North Channel" Bay-Goose Dike - Longitudinal Section - Section 30+453.5

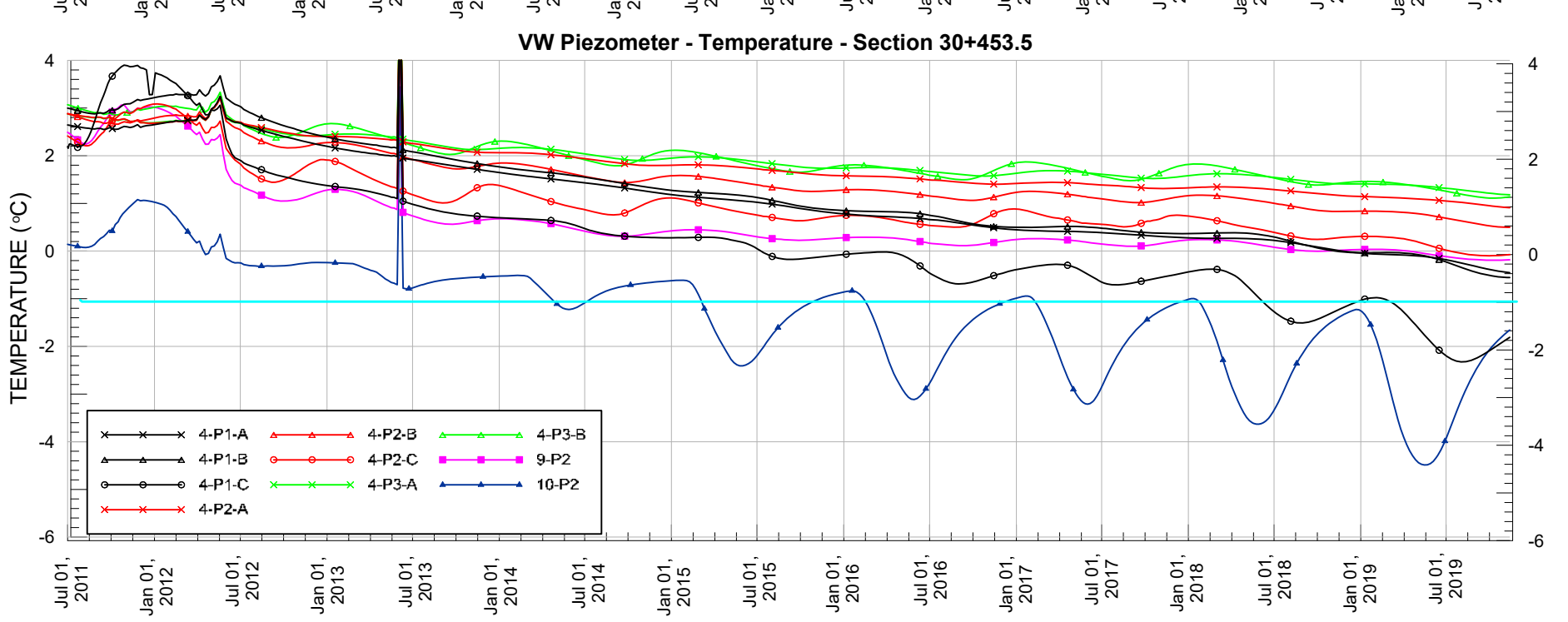
NORTH — SOUTH



VW Piezometer - Total Head



VW Piezometer - Temperature - Section 30+453.5



NOTES:

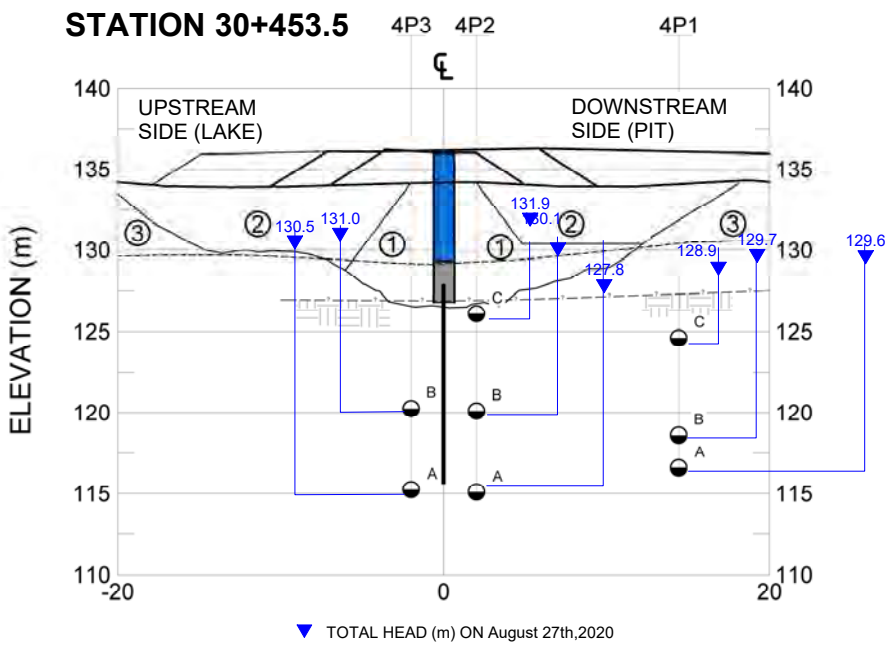
1. All 4P1, 4P2C and 10P2 is given unstable readings and since the temperature either shows a negative reading or is close to a negative reading it is assumed to be frozen.
2. Pressure changes are attributed to the drill and blast in Portage Pit E5 along with ice buildup that occurs. Mining in Pit E finished on Oct. 26th/19.
3. Some of the PWP that are over the Upstream Water Level can be attributed to having a negative temperature and assumed frozen.

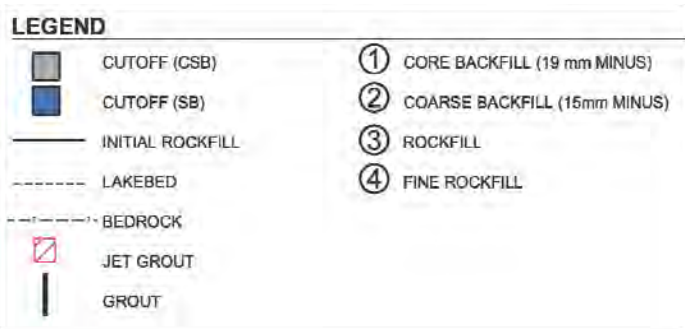
PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

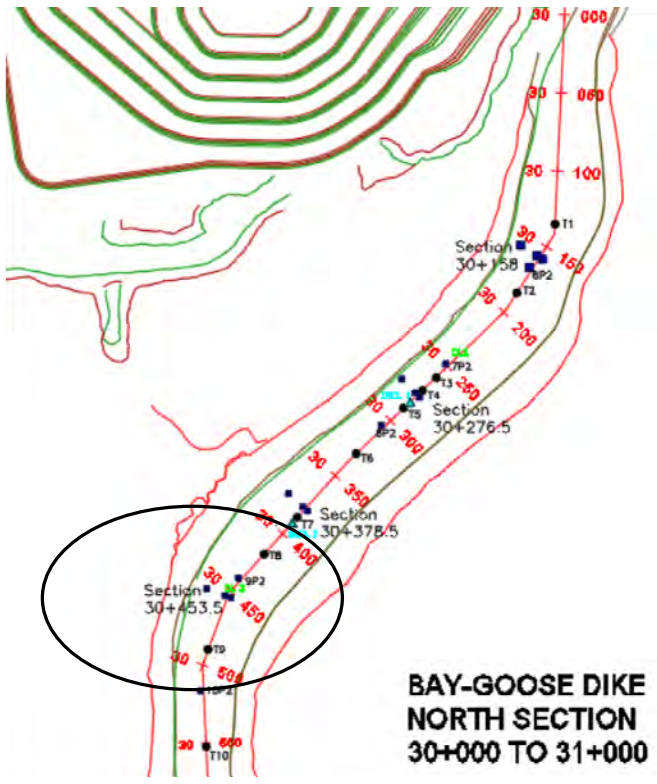
TITLE: BAYGOOSE DIKE
Section 30+453.5 - PIEZOMETRIC DATA
(July 1/11 to Aug 27/20)

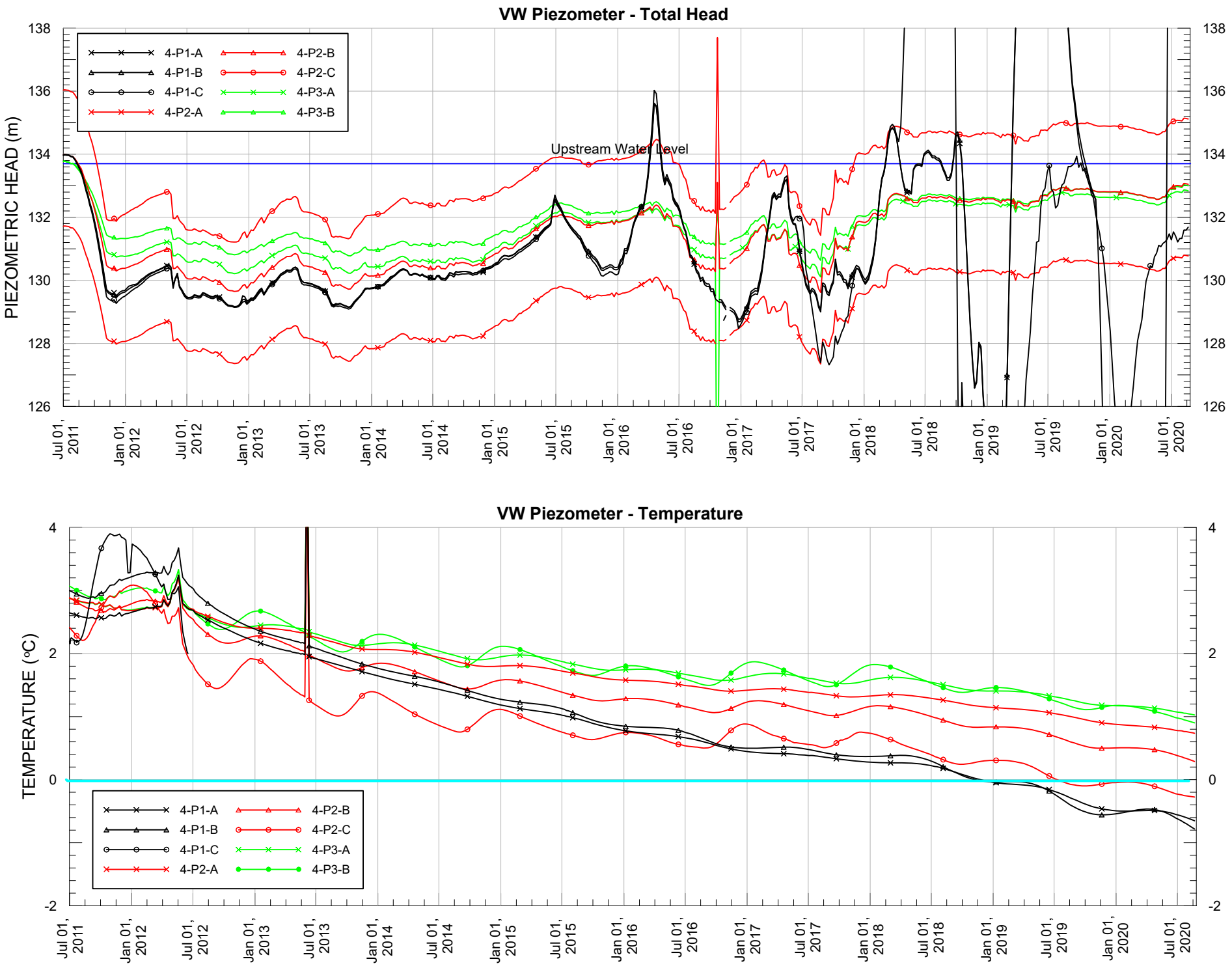
AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	FIGURE 7	
REVIEW				









NOTES:

1. 4P1 and 4P2CPWP is given unstable readings and since the temperature is close to a freezing temperature it is assumed to be frozen.
2. Pressure changes are attributed to the drill and blast in Portage Pit E5 along with ice buildup that occurs. Mining in Pit E finished on Oct. 26/19
3. Some of the PWP that are over the Upstream Water Level can be attributed to having a negative temperature and assumed frozen and data considered to not be reliable.

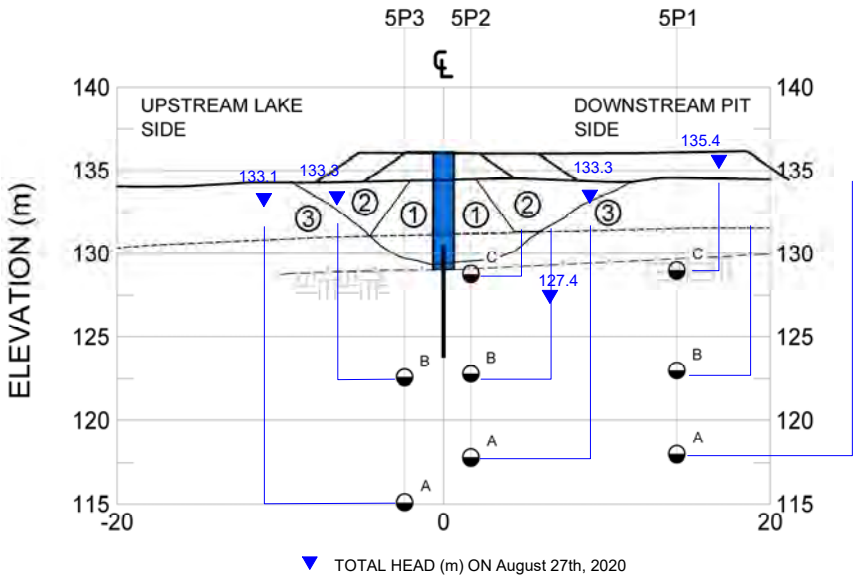
PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

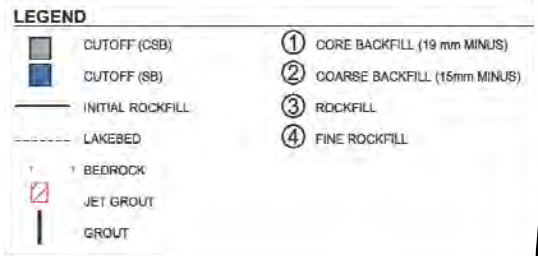
TITLE: BAYGOOSE DIKE - SECTION 30+453.5
PIEZOMETRIC DATA
(July 1/11 to Aug 27/20)

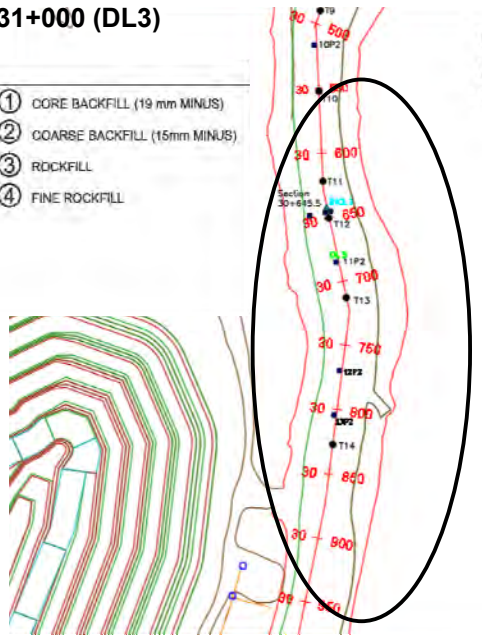
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	FIGURE 8	
REVIEW				

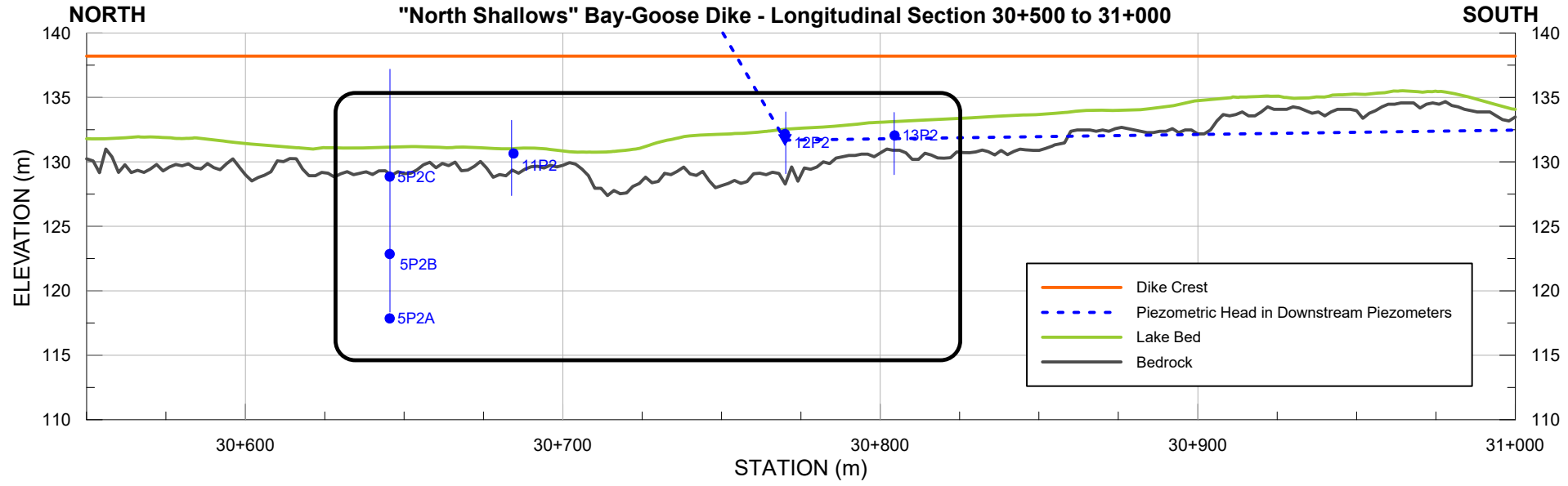
"North Shallows" Bay-Goose Dike - 30+500 to 31+000 (DL3)



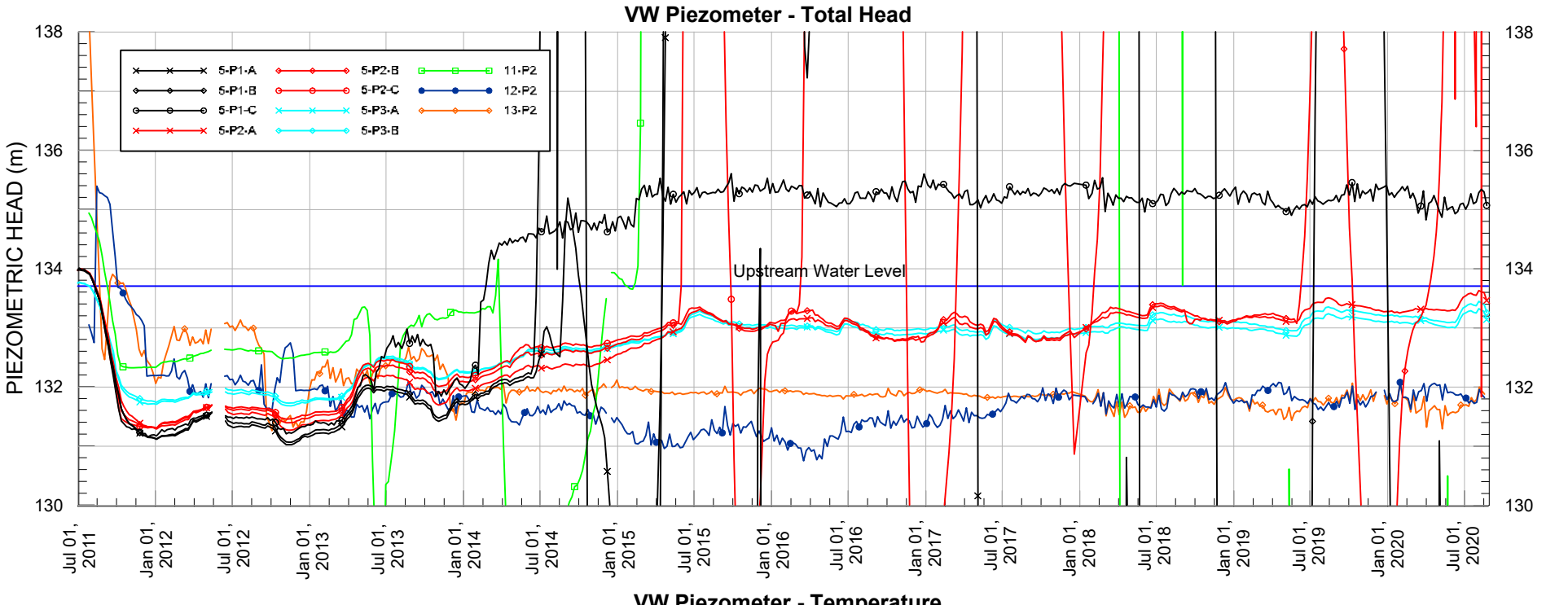




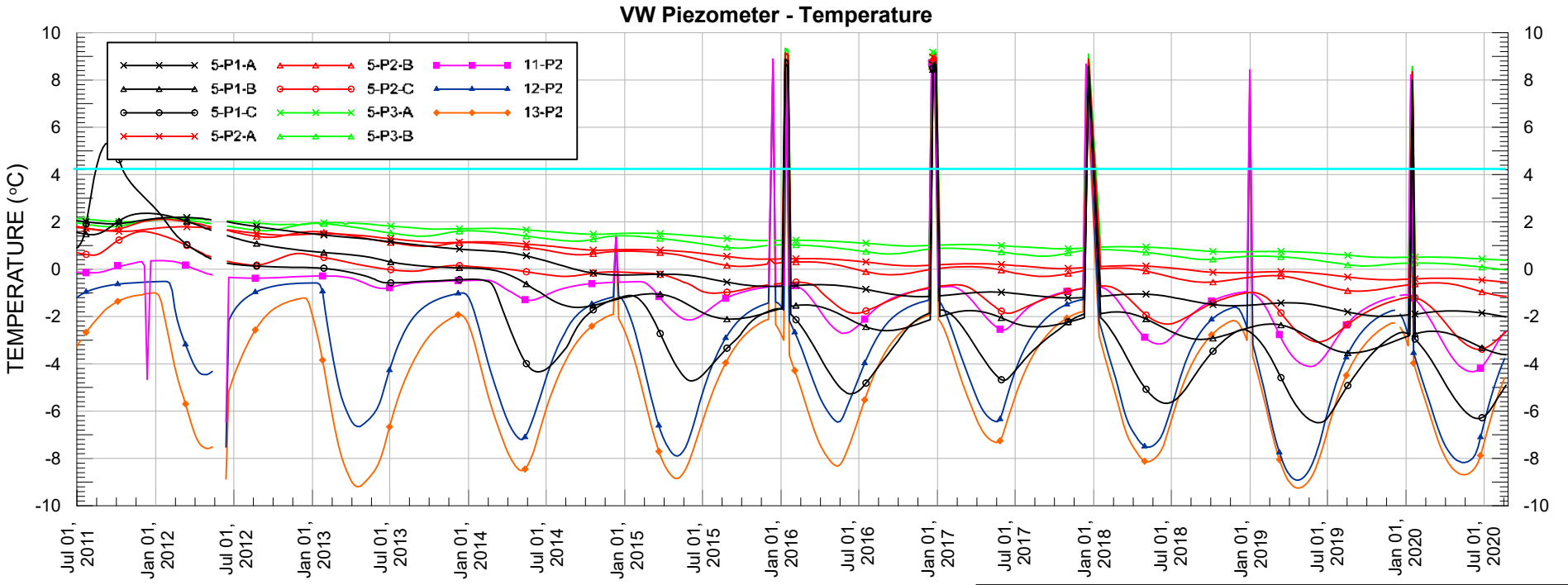
"North Shallows" Bay-Goose Dike - Longitudinal Section 30+500 to 31+000



VW Piezometer - Total Head



VW Piezometer - Temperature



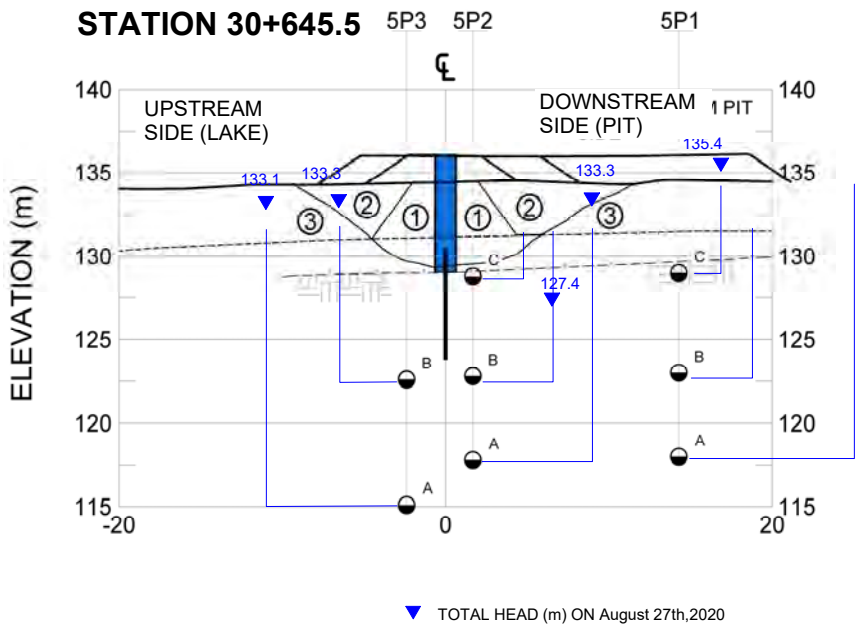
NOTES:
1. **5P1A, 5P1B, 5P1C, 5P2C and 11P2 are giving unstable readings and since the temperature shows a negative reading it is assumed to be frozen.**

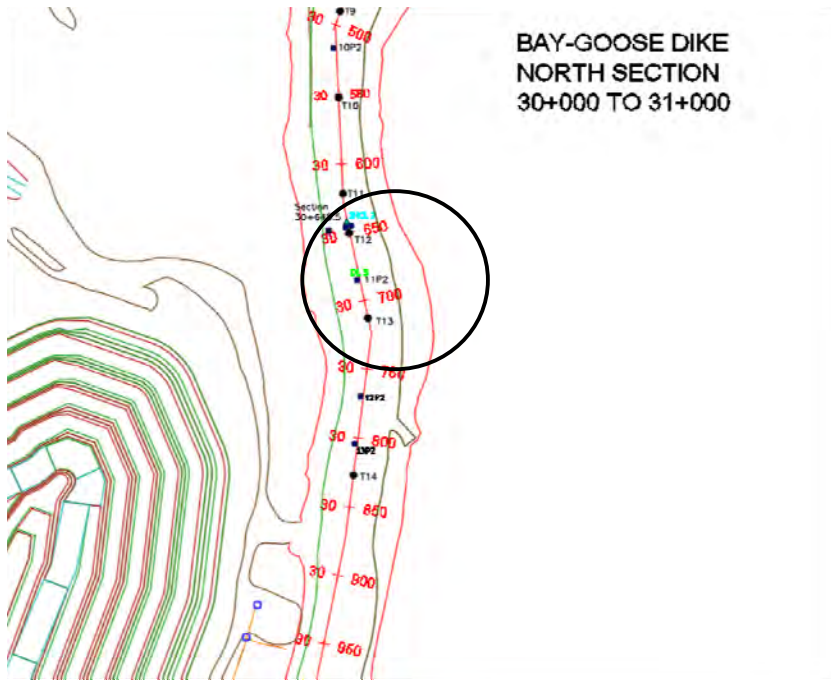
PROJECT: **AGNICO EAGLE MINES LIMITED**
MEADOWBANK GOLD PROJECT
NUNAVUT

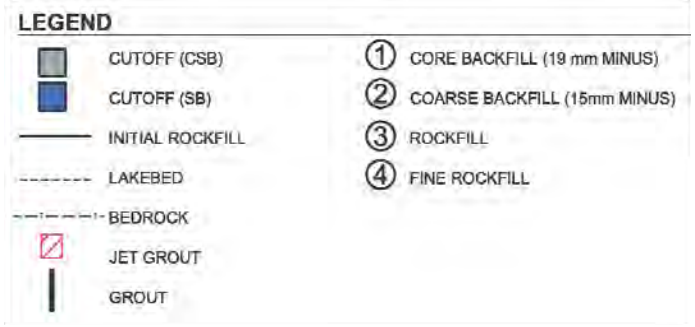
TITLE: **BAYGOOSE DIKE**
30+550 to 31+000 - PIEZOMETRIC DATA
(July 1/11 to Aug 27/20)

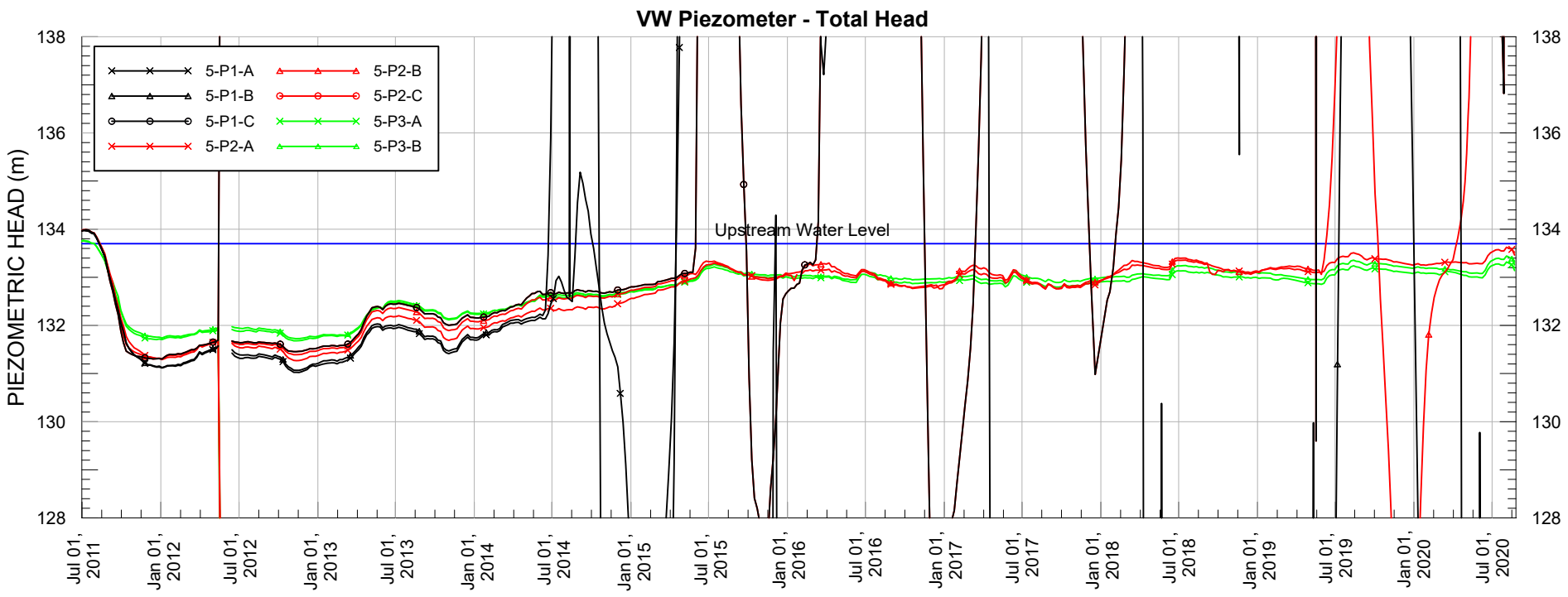
AGNICO EAGLE MEADOWBANK

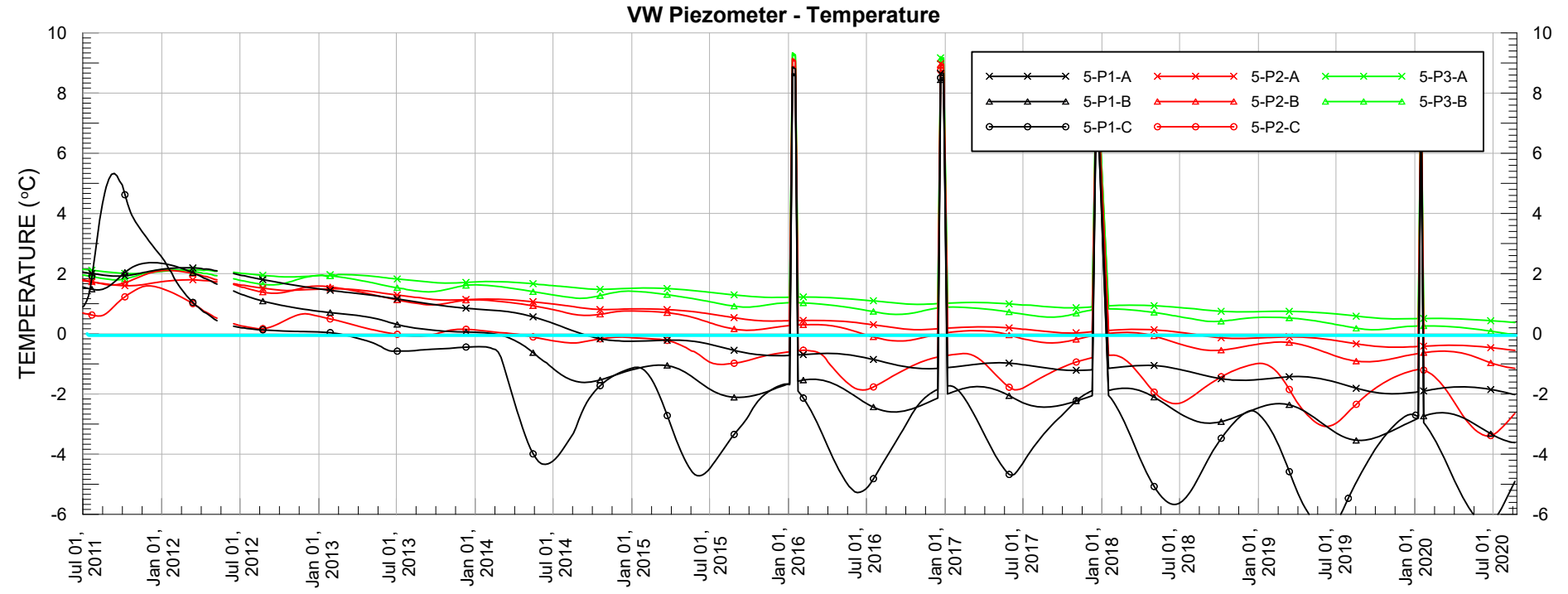
PROJECT No. 09-1428-5007			PHASE No. 4000	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	**FIGURE 9**	
REVIEW				











NOTES:

1. 5P1A, 5P1B, 5P1C, 5P2C are giving unstable readings and since the temperature shows a negative reading it is assumed to be frozen and PWP data is not considered reliable.

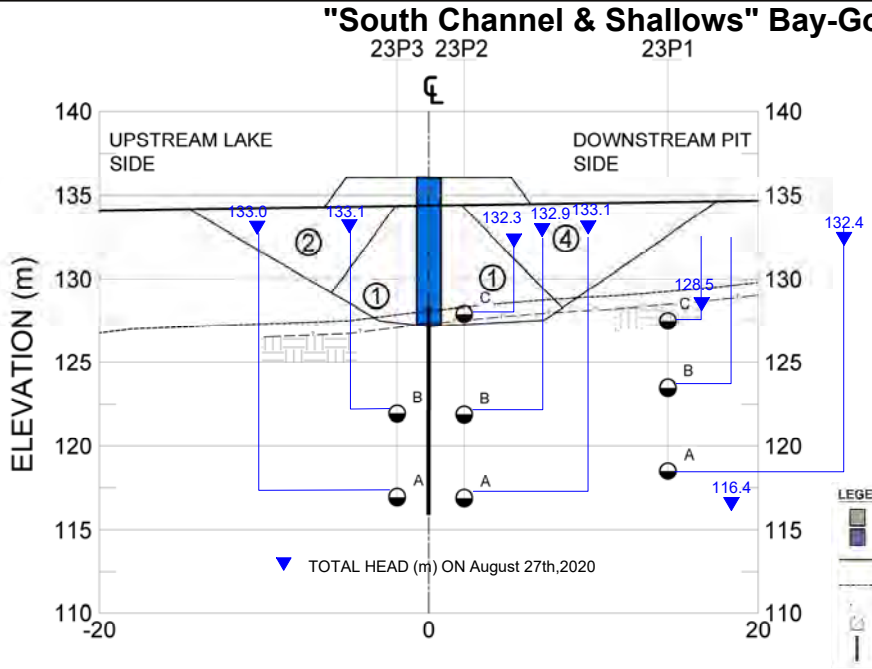
PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

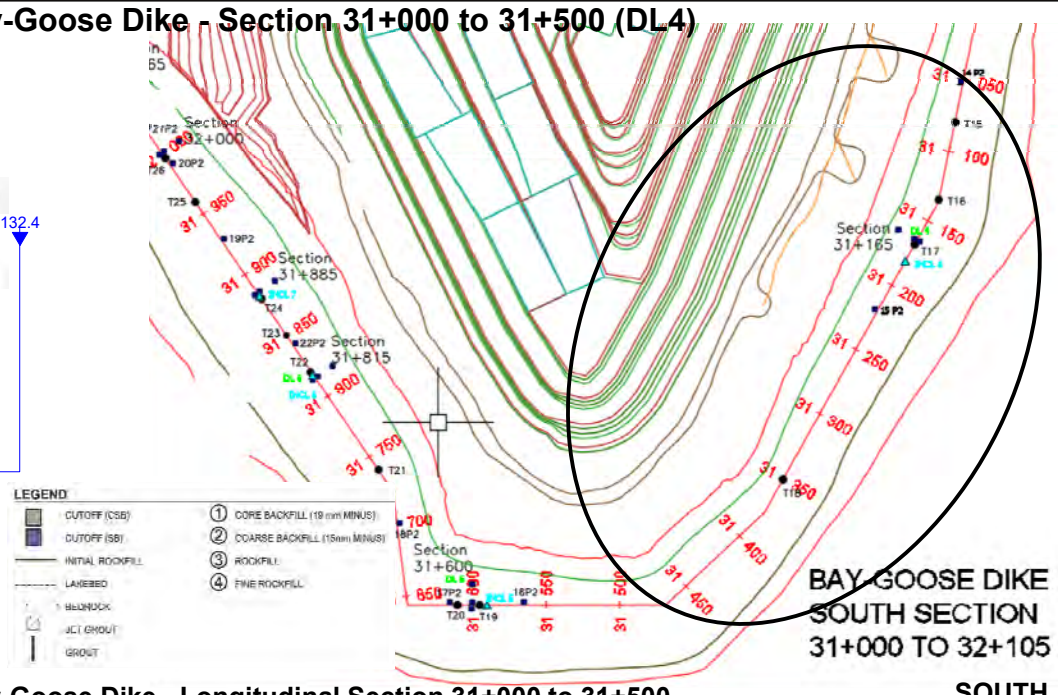
TITLE: BAYGOOSE DIKE - SECTION 30+645.5
PIEZOMETRIC DATA
(July 1/11 to Aug 27/20)

AGNICO EAGLE MEADOWBANK

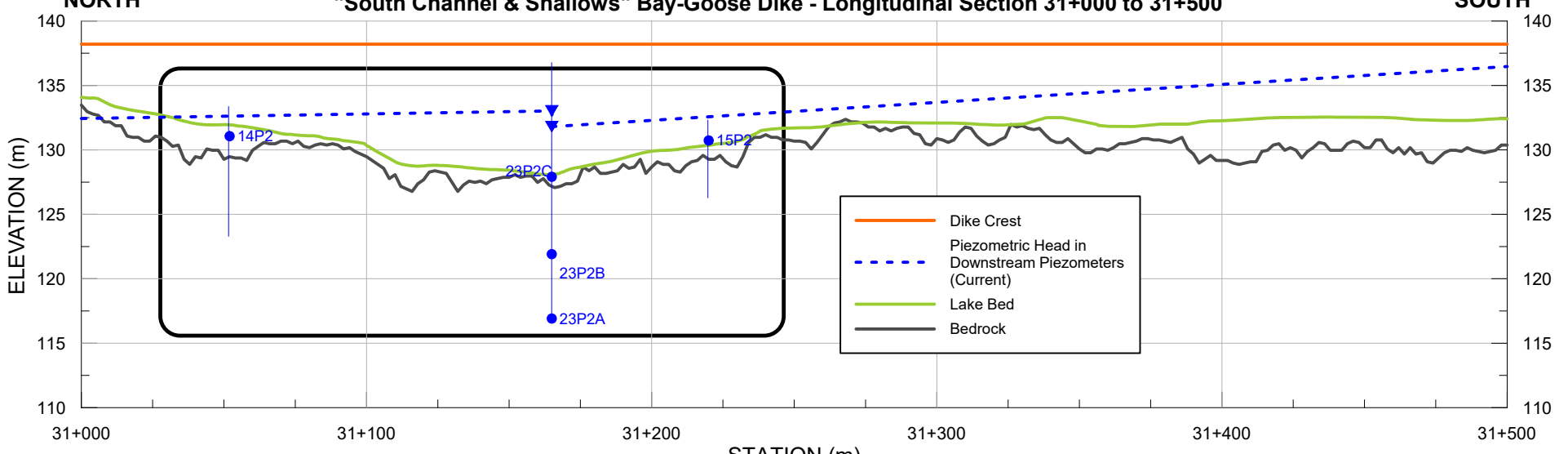
PROJECT No.			PHASE No.
DESIGN	TO	17JAN14	SCALE AS SHOWN REV.
CADD	TO	17JAN14	
CHECK			FIGURE 10
REVIEW			

"South Channel & Shallows" Bay-Goose Dike - Section 31+000 to 31+500 (DL4)

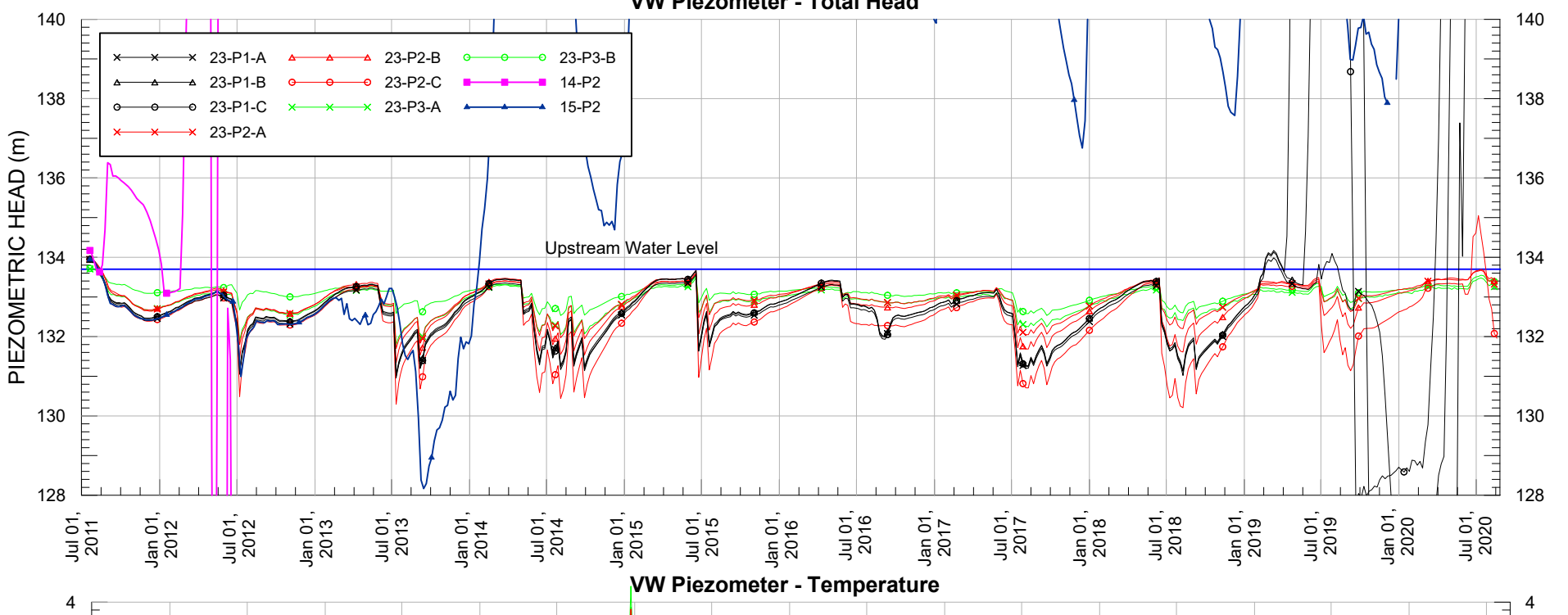




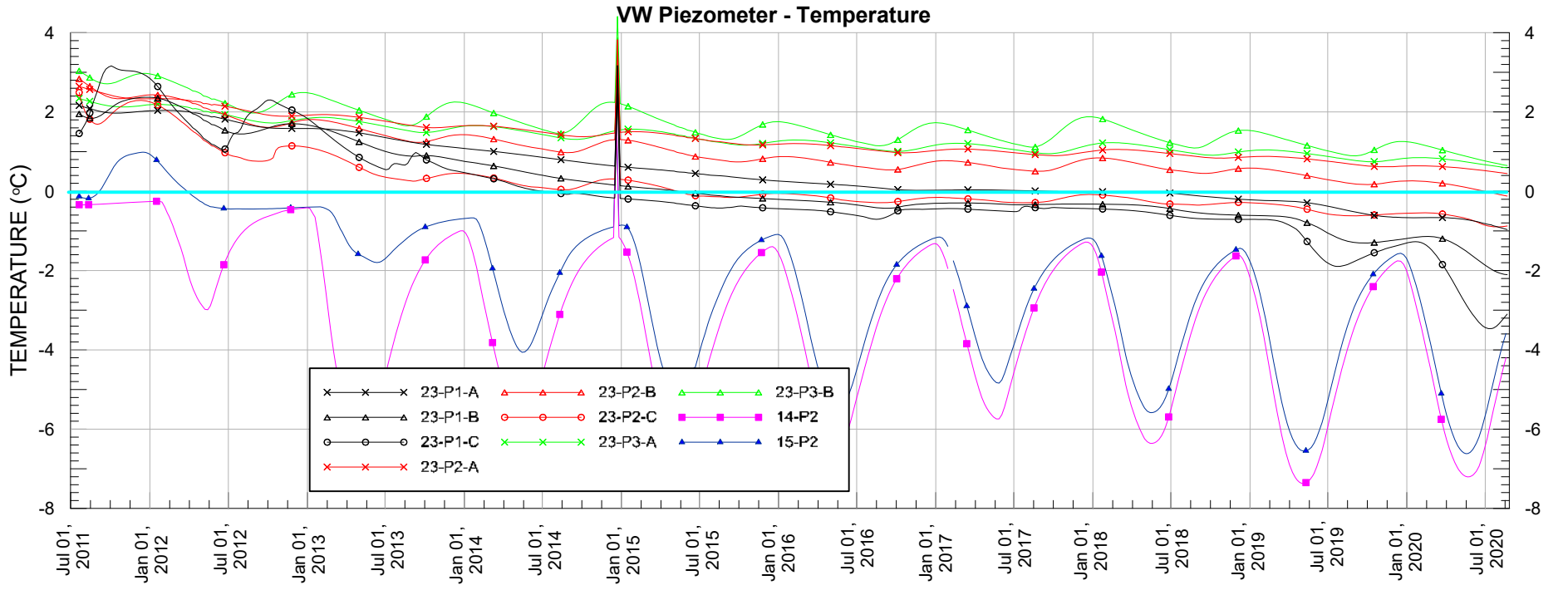
"South Channel & Shallows" Bay-Goose Dike - Longitudinal Section 31+000 to 31+500



VW Piezometer - Total Head



VW Piezometer - Temperature



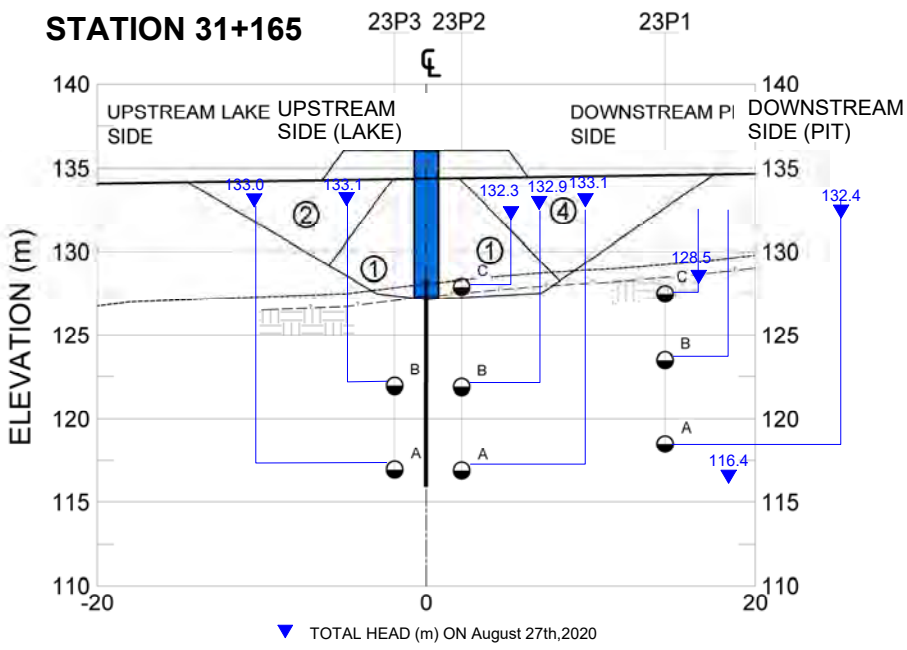
NOTES:

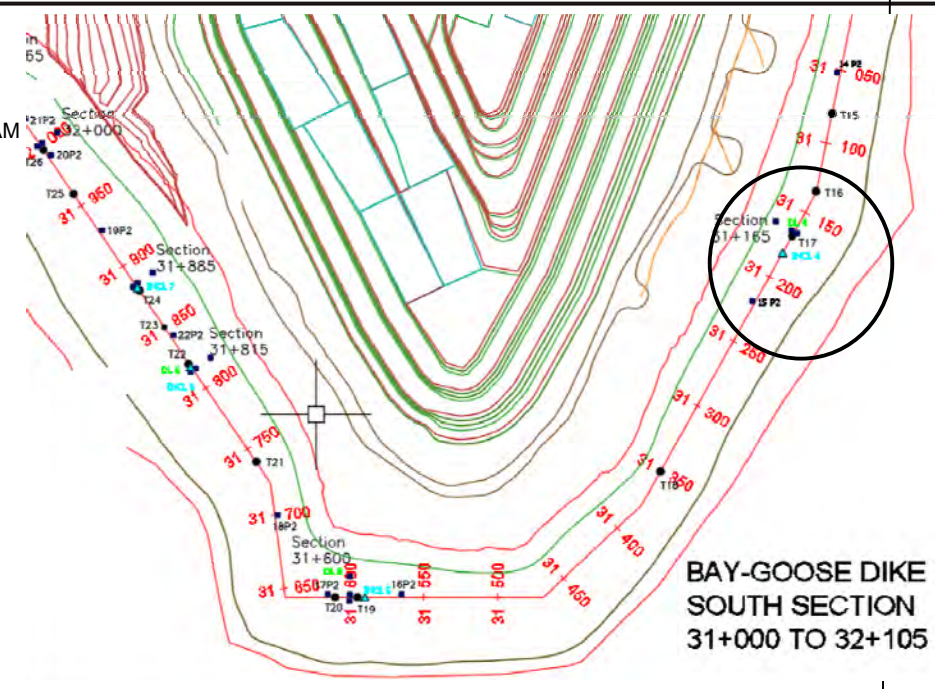
1. **Pz23P1B, Pz23P1C, 14P2 and 15P2are given unstable readings and since the temperature shows a negative reading it is assumed to be frozen.**
2. **PWP rises and falls due to ponding in the area and continous pumping, and allowing the ponding to raise. The steady increase is when the ponding area freezes, and no pumping is done till the thawing of the area.**

PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE 31+000 to 31+500 - PIEZOMETRIC DATA (July 1/11 to Aug 27/20)

AGNICO EAGLE MEADOWBANK

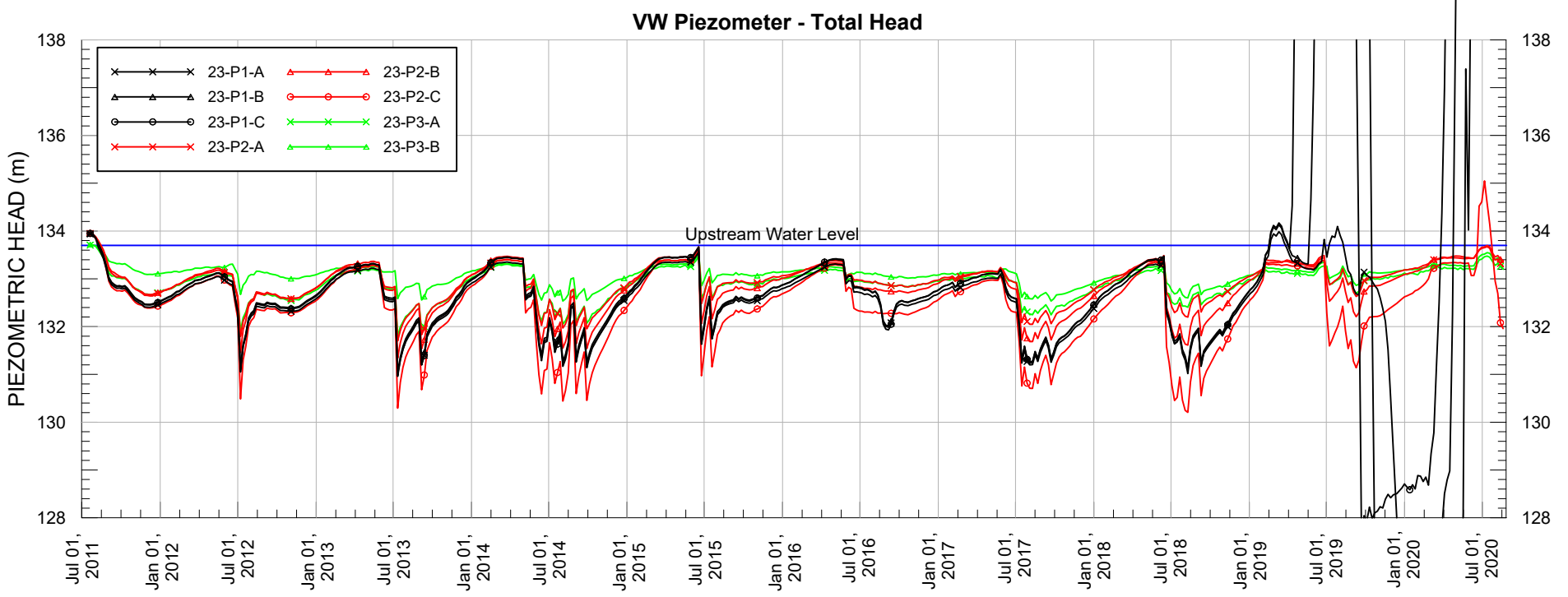
PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	FIGURE 11	
REVIEW				

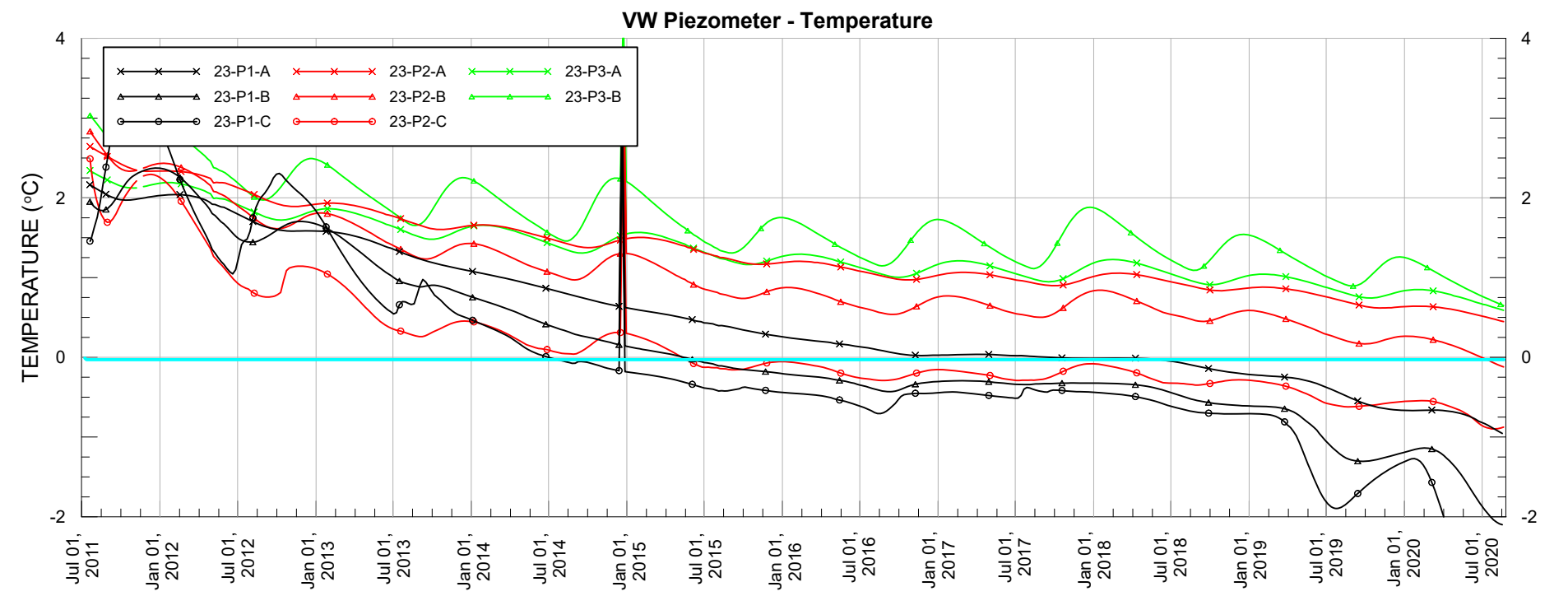




LEGEND

- CUTOFF (CSB)
- CUTOFF (SB)
- INITIAL ROCKFILL
- LAKEBED
- BEDROCK
- JET GROUT
- GROUT
- ① CORE BACKFILL (19 mm MINUS)
- ② COARSE BACKFILL (15mm MINUS)
- ③ ROCKFILL
- ④ FINE ROCKFILL





NOTES:

1. **PWP rises and falls due to ponding in the area and continous pumping, and allowing the ponding to raise. The steady increase is when the ponding area freezes, and no pumping is done till the thawing of the area.**
2. **23-P1-B and 23-P1-C have a negative temperature and appear to be frozen and not giving good data.**

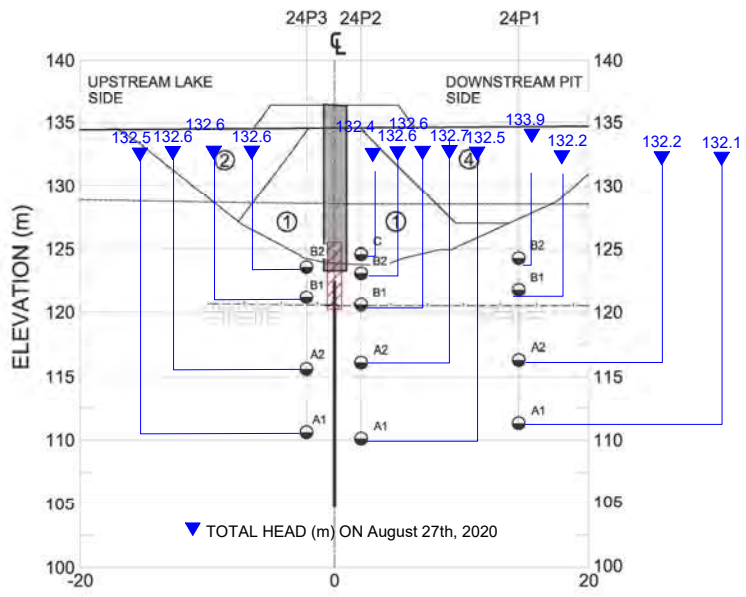
PROJECT: **AGNICO EAGLE MINES LIMITED**
MEADOWBANK GOLD PROJECT
NUNAVUT

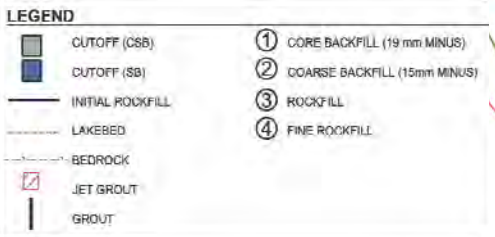
TITLE: **BAYGOOSE DIKE - SECTION 31+165**
PIEZOMETRIC DATA
(July 1/11 to Aug 27/20)

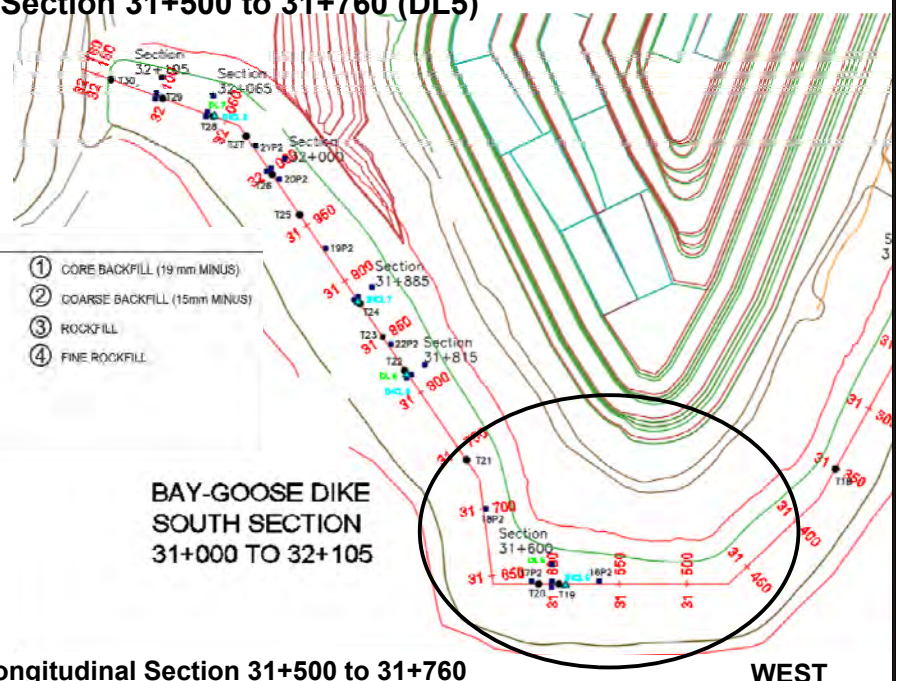
AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.
DESIGN	TD	28AUG14	SCALE AS SHOWN REV.
CADD	TD	28AUG14	
CHECK	PG	28AUG14	**FIGURE 12**
REVIEW			

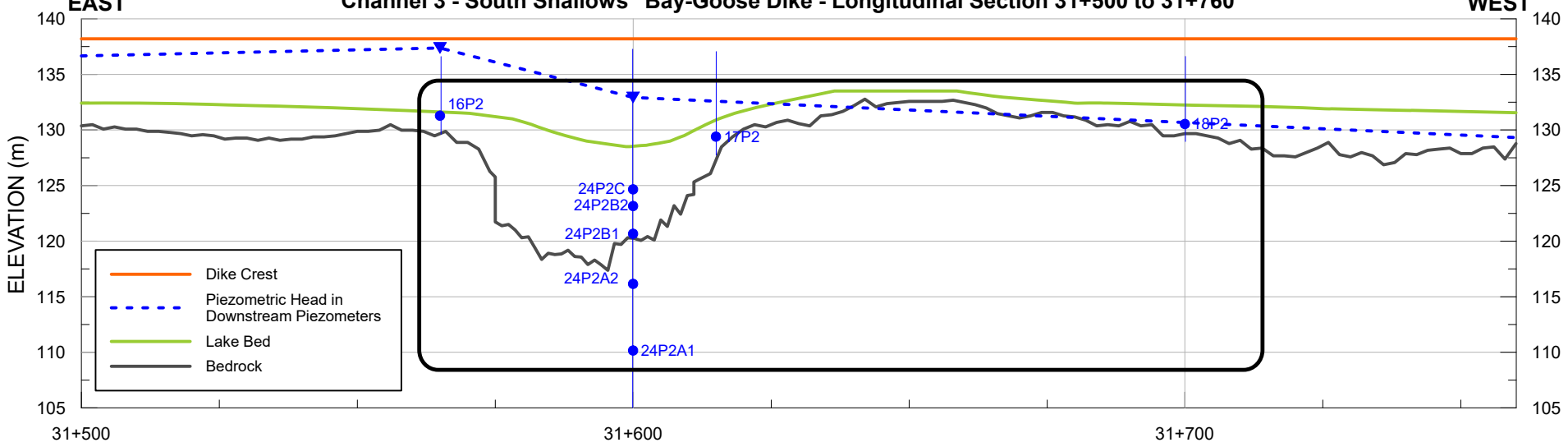
"Channel 3 - South Shallows" Bay-Goose Dike - Section 31+500 to 31+760 (DL5)



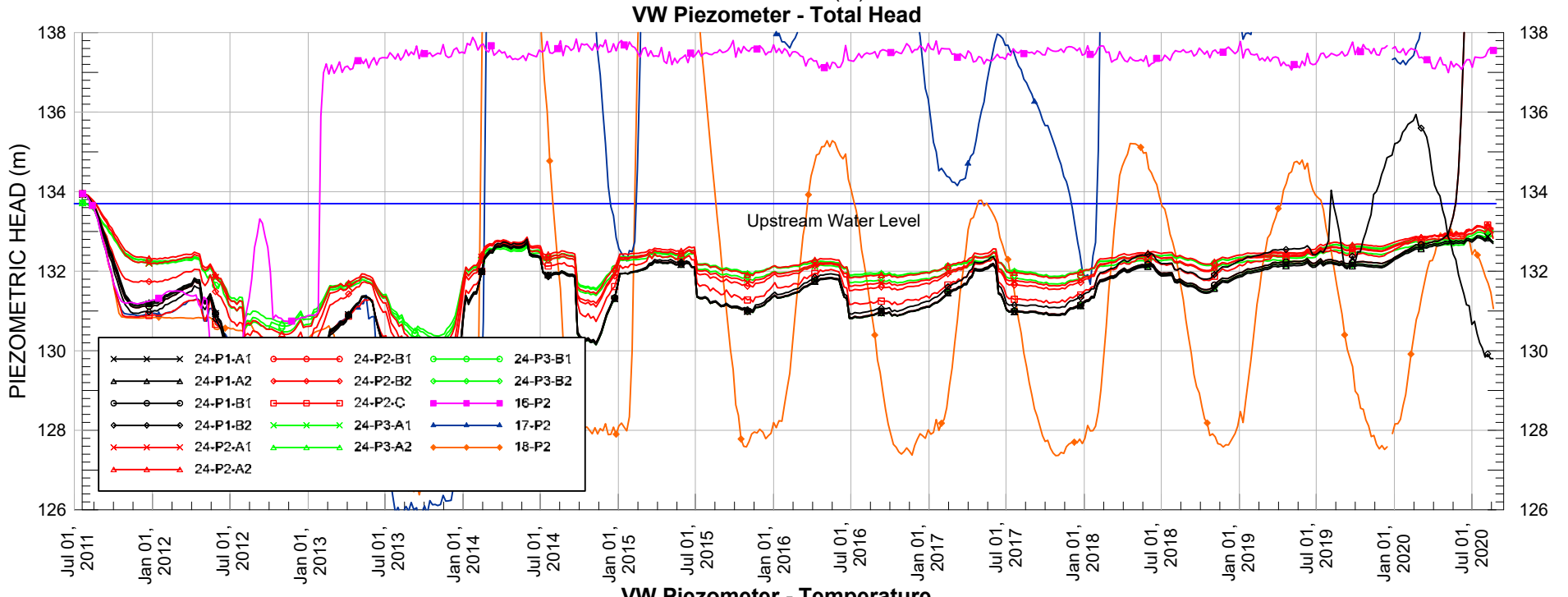




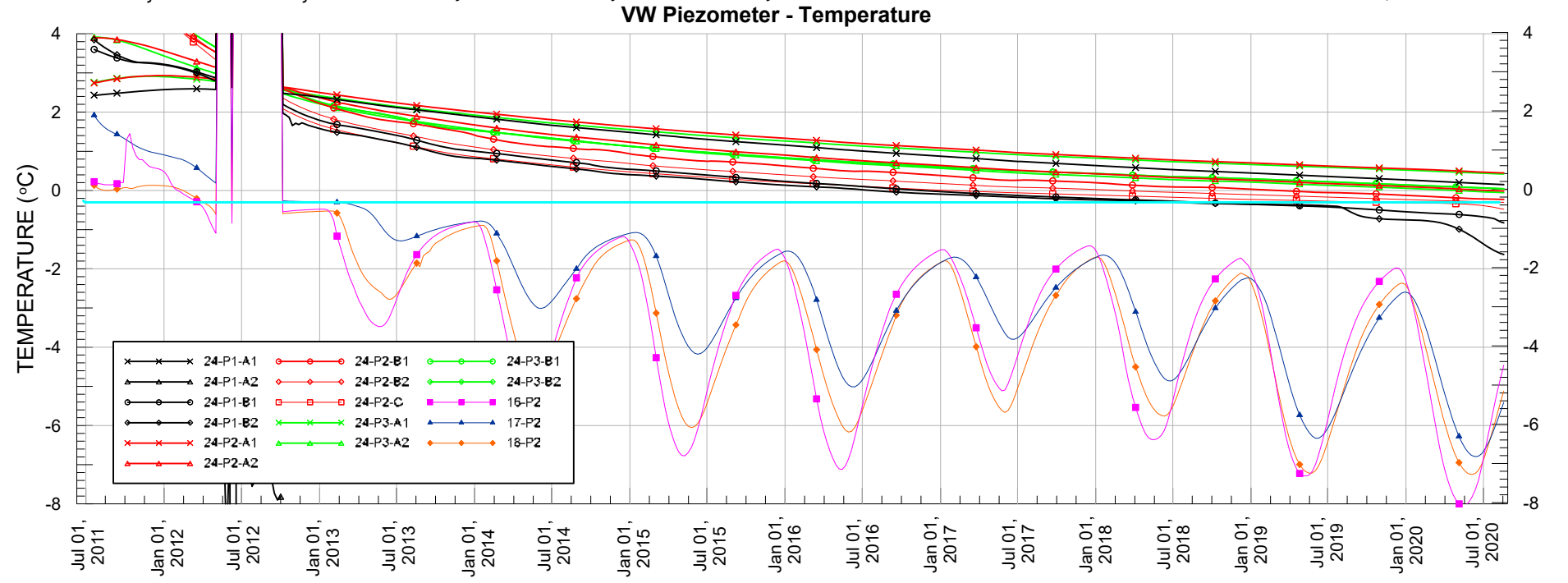
"Channel 3 - South Shallows" Bay-Goose Dike - Longitudinal Section 31+500 to 31+760



VW Piezometer - Total Head



VW Piezometer - Temperature



NOTES:

1. 16P2, 17P2 and 18P2 are given unstable readings and since the temperature shows a negative reading it is assumed to be frozen.
2. PWP is following same trend as previous years. When ice builds the pressure increases and when it melts in summer the pressure decreases

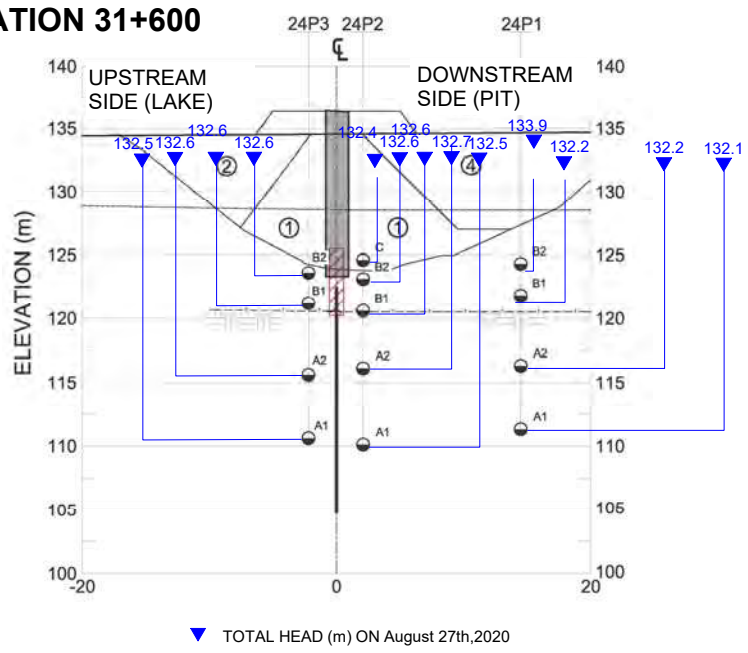
PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE: BAYGOOSE DIKE
31+500 to 31+760 - PIEZOMETRIC DATA
(July 1/11 to Aug 27/20)

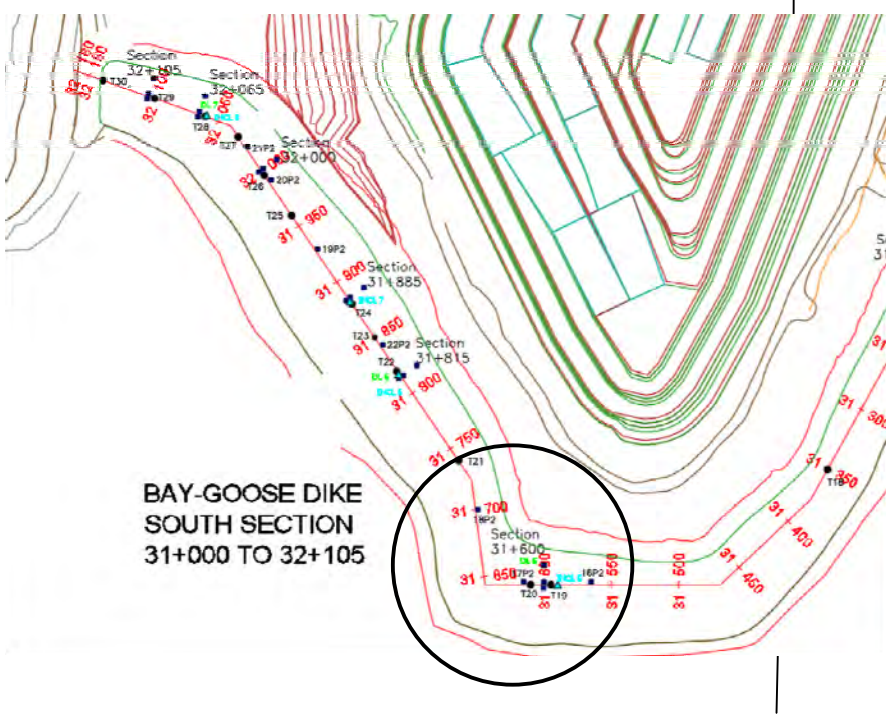
AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.
DESIGN	TD	28AUG14	SCALE AS SHOWN REV.
CADD	TD	28AUG14	
CHECK	PG	28AUG14	FIGURE 13
REVIEW			

STATION 31+600

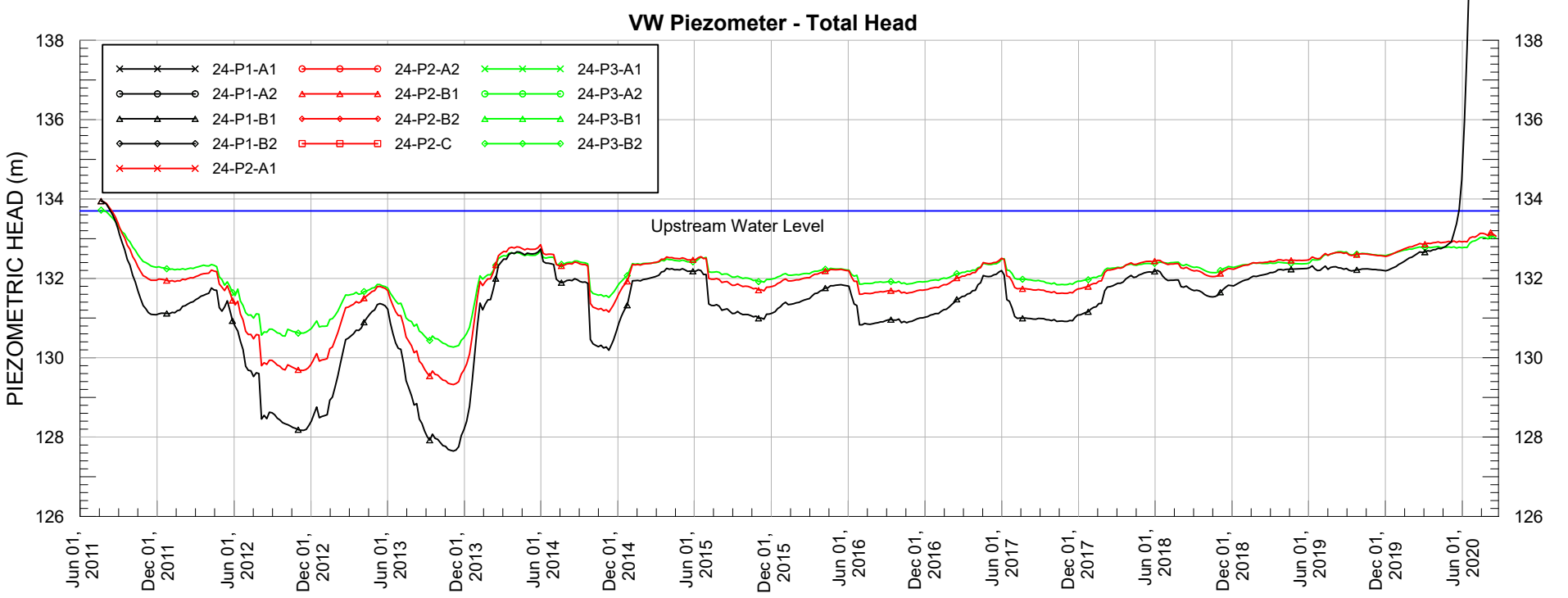


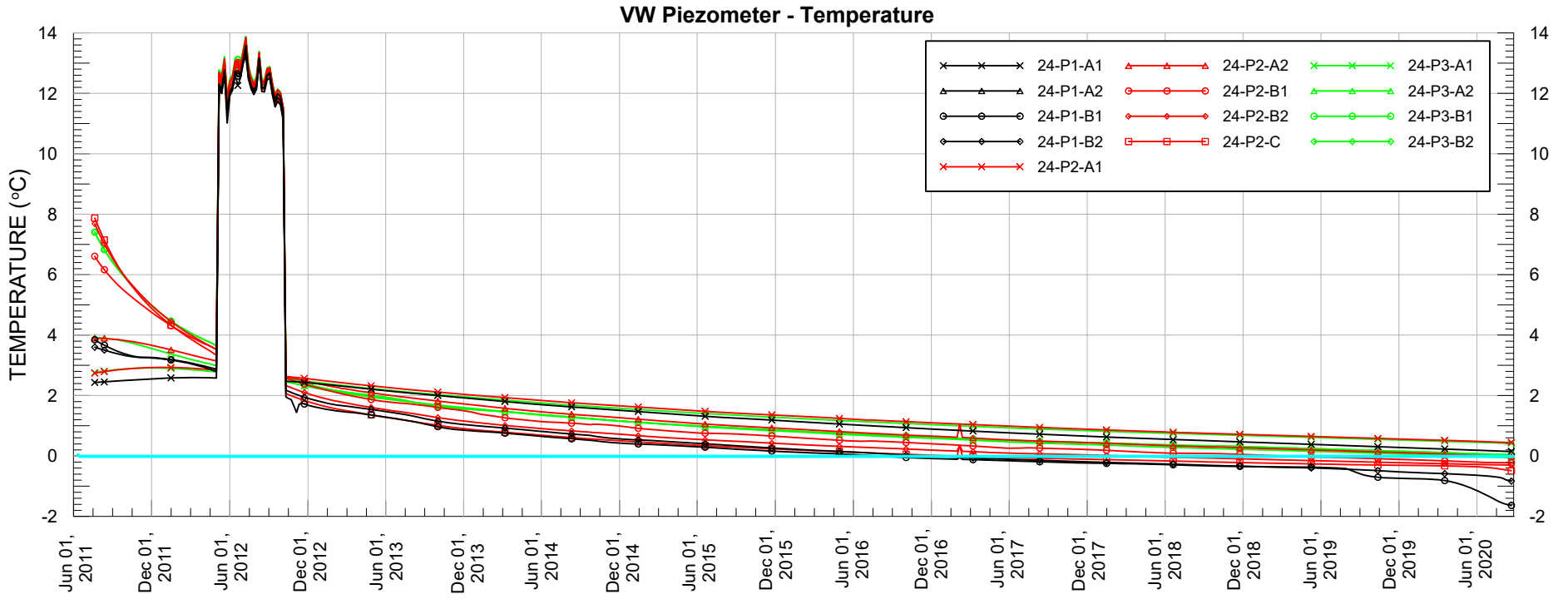
▼ TOTAL HEAD (m) ON August 27th,2020



LEGEND

- CUTOFF (CSB)
- CUTOFF (SB)
- INITIAL ROCKFILL
- LAKEBED
- BEDROCK
- JET GROUT
- GROUT
- ① CORE BACKFILL (19 mm MINUS)
- ② COARSE BACKFILL (15mm MINUS)
- ③ ROCKFILL
- ④ FINE ROCKFILL





NOTES:

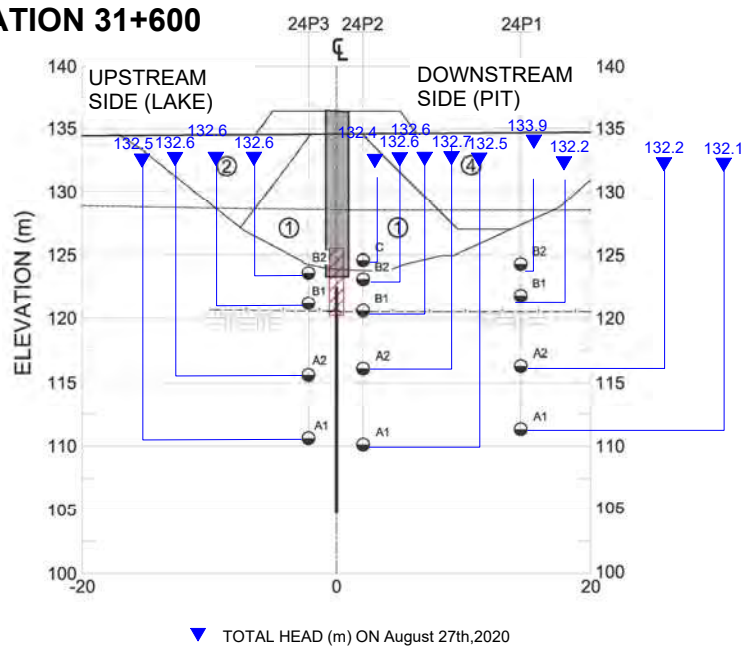
1. **PWP is following same trend as previous years. When ice builds the pressure increases and when it melts in summer the pressure decreases**
2. **Small gaps in data are due to a low battery. Battery was changed the following day.**
3. **The large temperature flucuation was due to a faulty MUX board which was changed when the new one arrived on site.**

PROJECT	**AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT**
TITLE	**BAYGOOSE DIKE - SECTION 31+600 PIEZOMETRIC DATA (July 1/11 to Aug 27/20)**

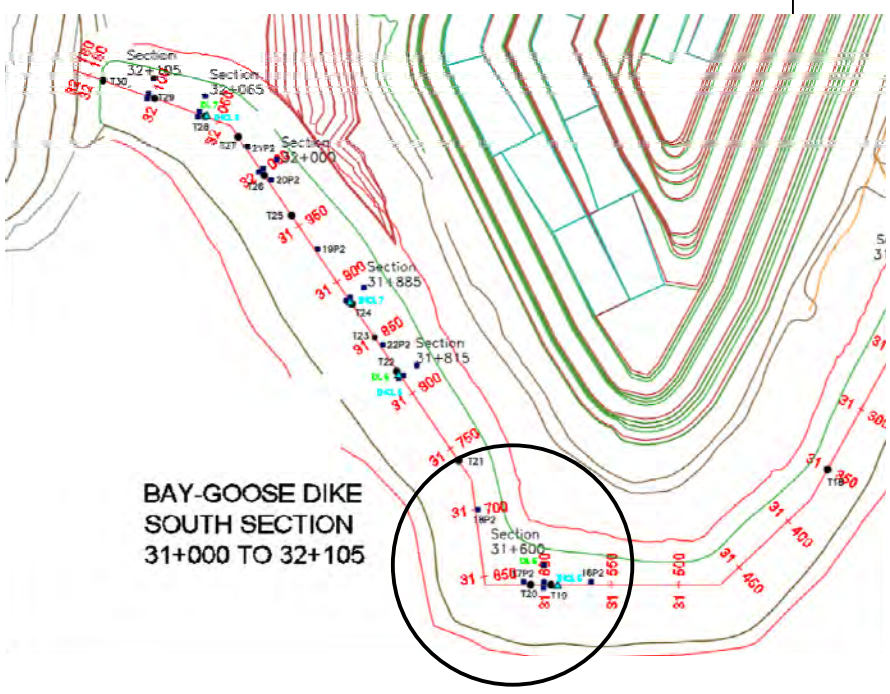
AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14	**FIGURE 14**	
CHECK	PG	28AUG14		
REVIEW				

STATION 31+600

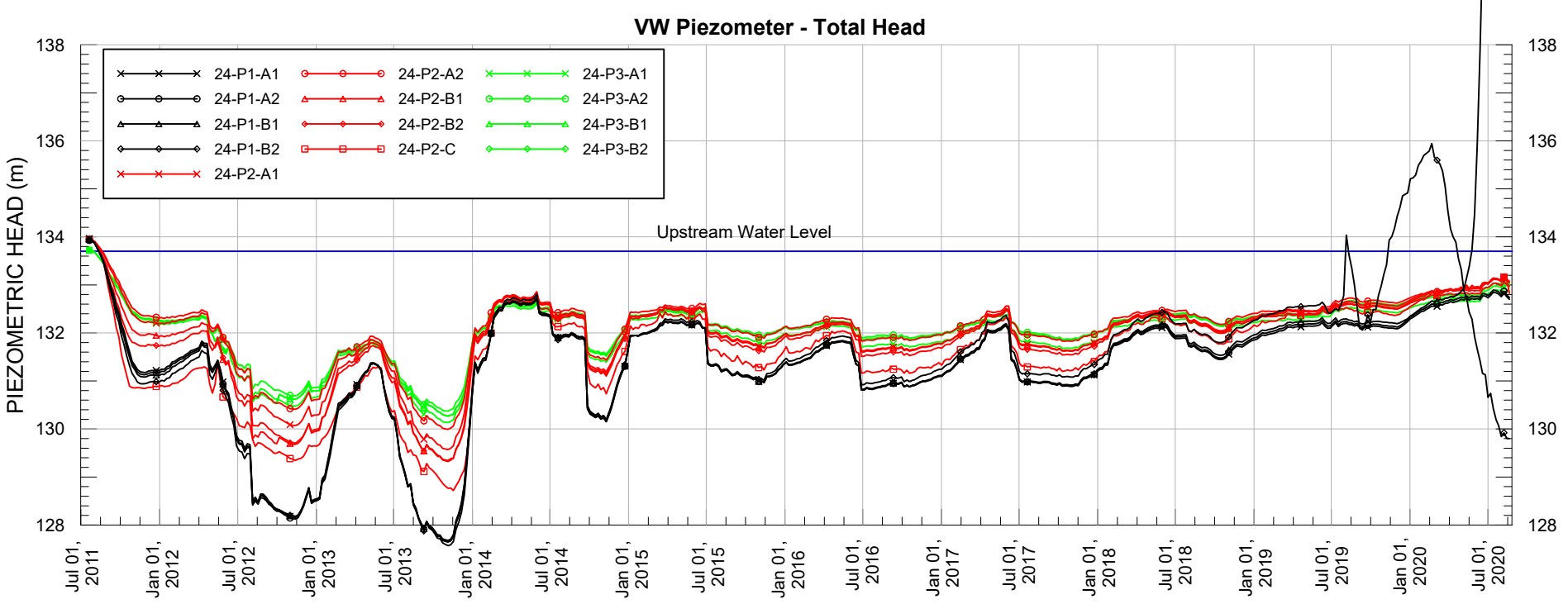


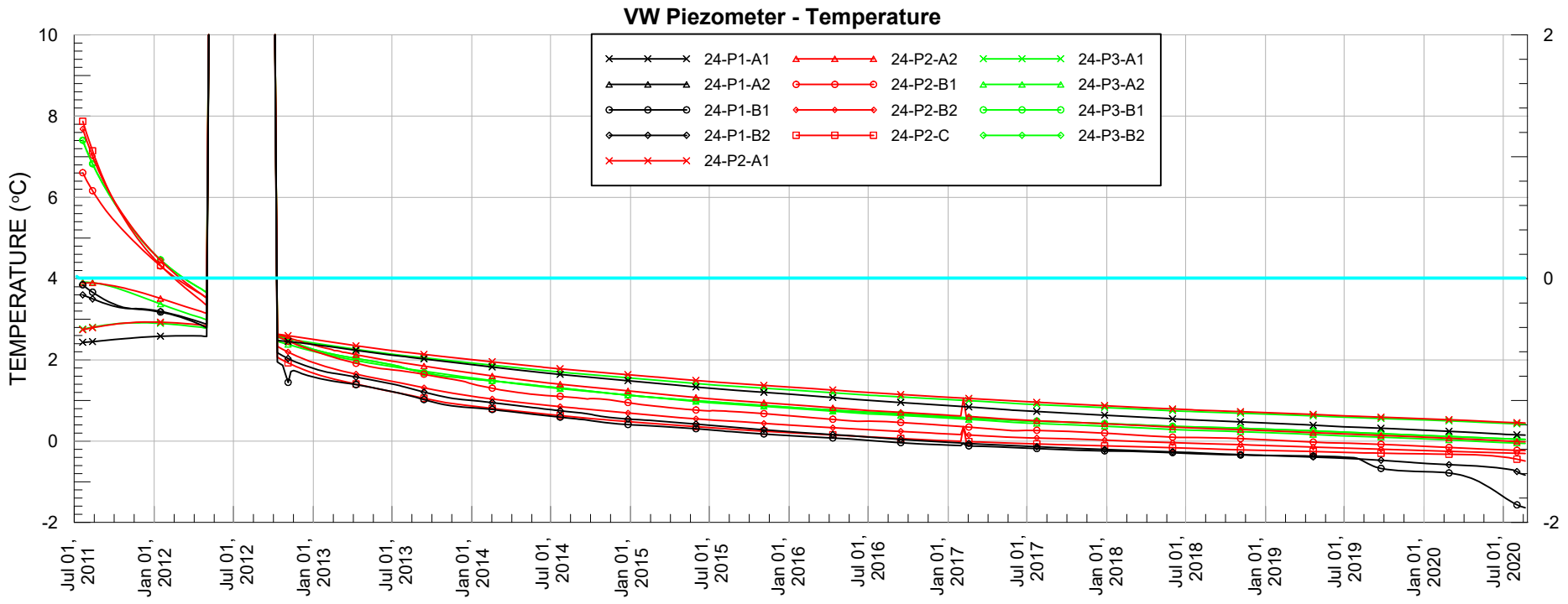
▼ TOTAL HEAD (m) ON August 27th,2020



LEGEND

- CUTOFF (CSB)
- CUTOFF (SB)
- INITIAL ROCKFILL
- LAKEBED
- BEDROCK
- JET GROUT
- GROUT
- ① CORE BACKFILL (19 mm MINUS)
- ② COARSE BACKFILL (15mm MINUS)
- ③ ROCKFILL
- ④ FINE ROCKFILL





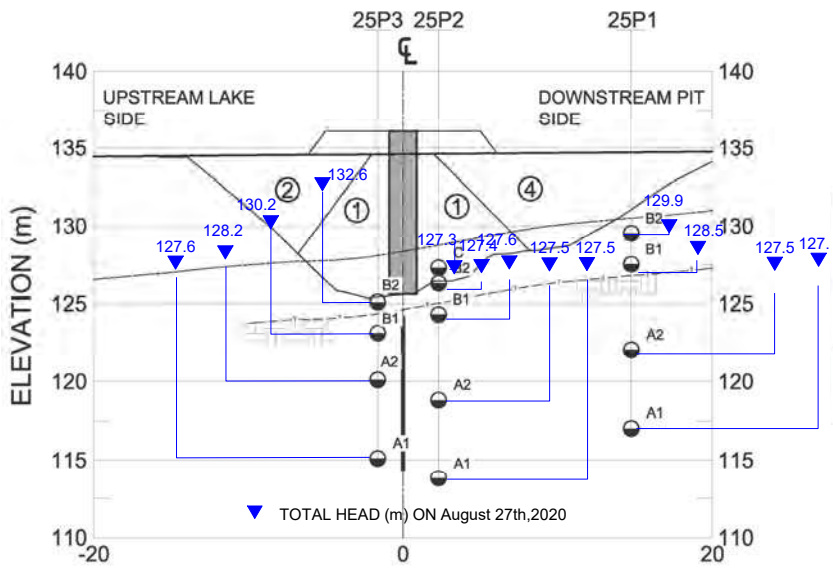
NOTES:
1. **PWP is following same trend as previous years. When ice builds the pressure increases and when it melts in summer the pressure decreases**
2.

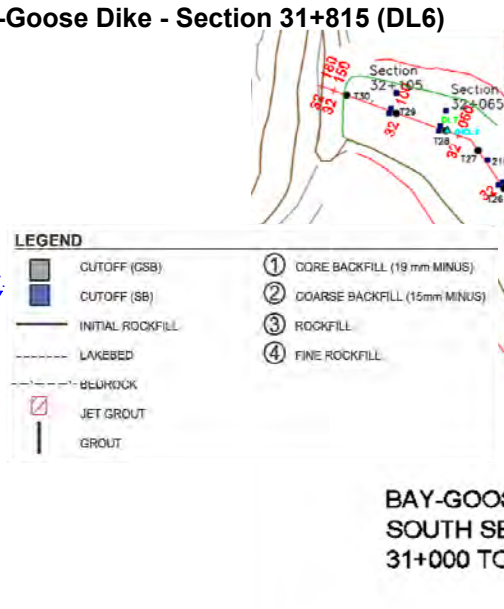
PROJECT	**AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT**
TITLE	**BAYGOOSE DIKE - SECTION 31+600 PIEZOMETRIC DATA (July 1/11 to Aug 27/20)**

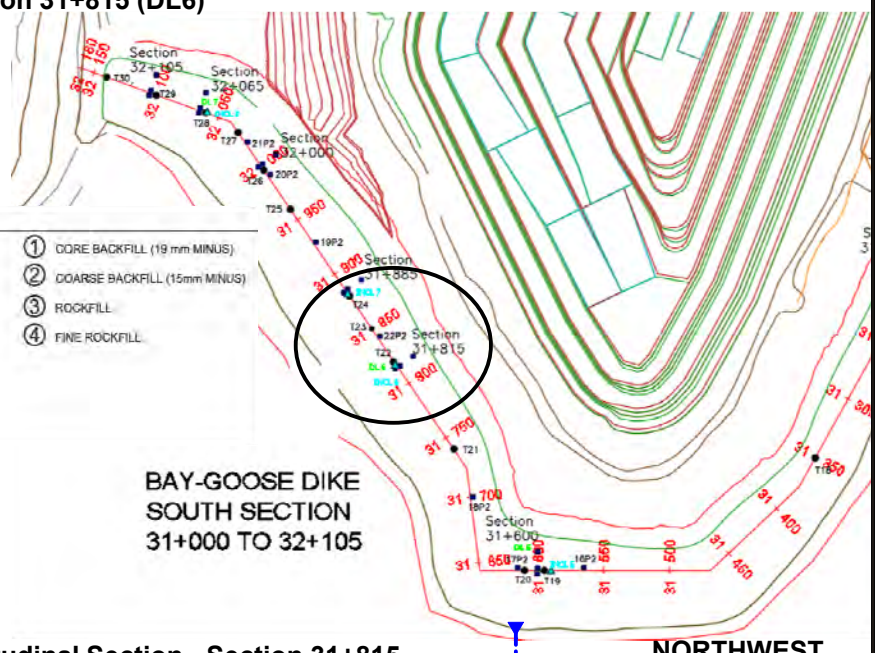
AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14	**FIGURE 14**	
CHECK	PG	28AUG14		
REVIEW				

"Channel 2 & Channel 1" Bay-Goose Dike - Section 31+815 (DL6)



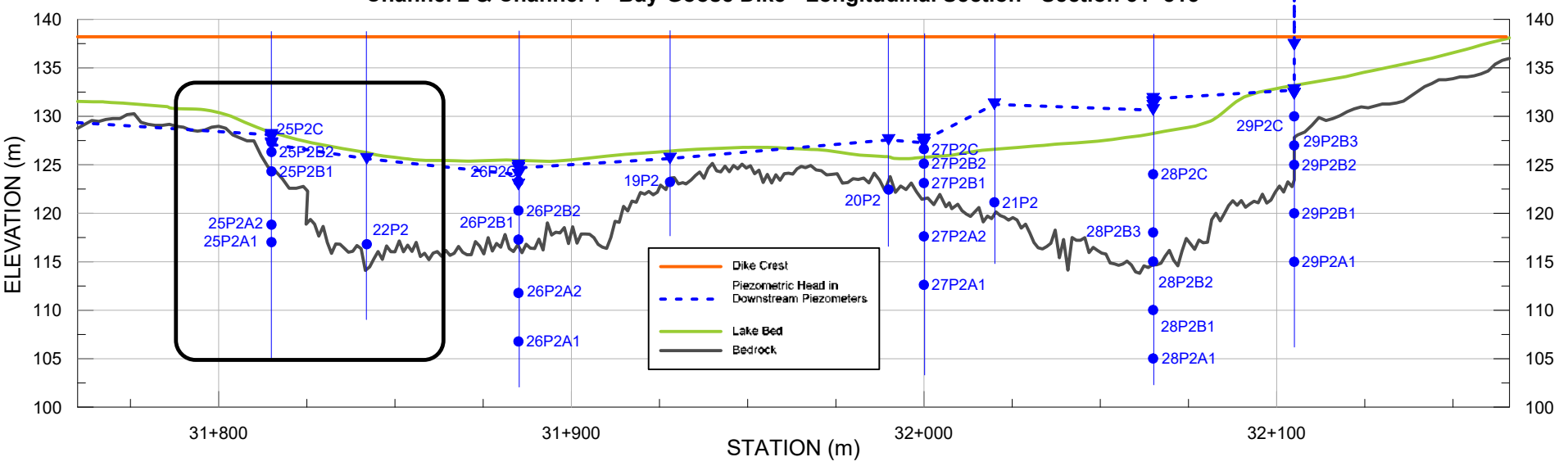




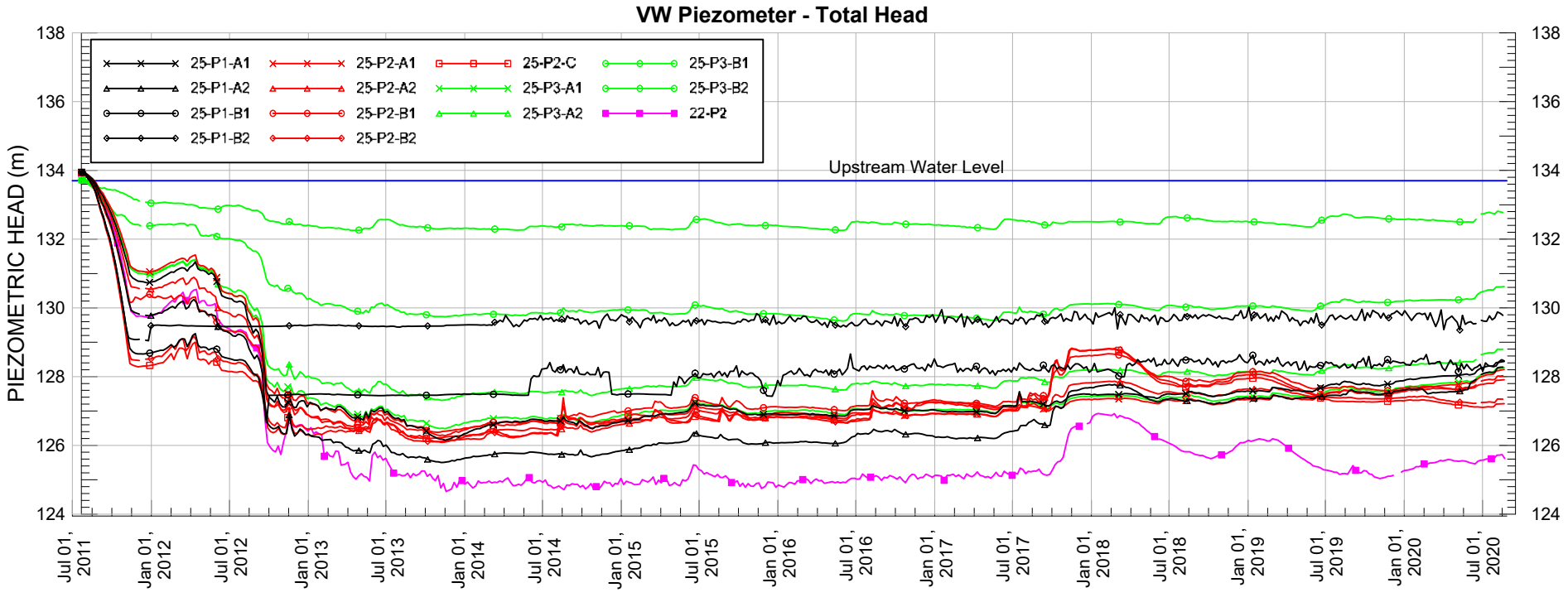
SOUTHEAST

"Channel 2 & Channel 1" Bay-Goose Dike - Longitudinal Section - Section 31+815

NORTHWEST



VW Piezometer - Total Head



VW Piezometer - Temperature - Channel 2 - Section 31+815

NOTES:

1. The rise in temperature and PWP was interpreted as the permafrost at the toe of the dike blocking the seepage path which led to this events. Will continue to monitor in the field and the instruments. Since the snow melt the blockage is not longer there and the PWP is on a downtrend.
2. 25P1B1 and 25P1B2 are showing a negative temperature reading and are assumed to be frozen.

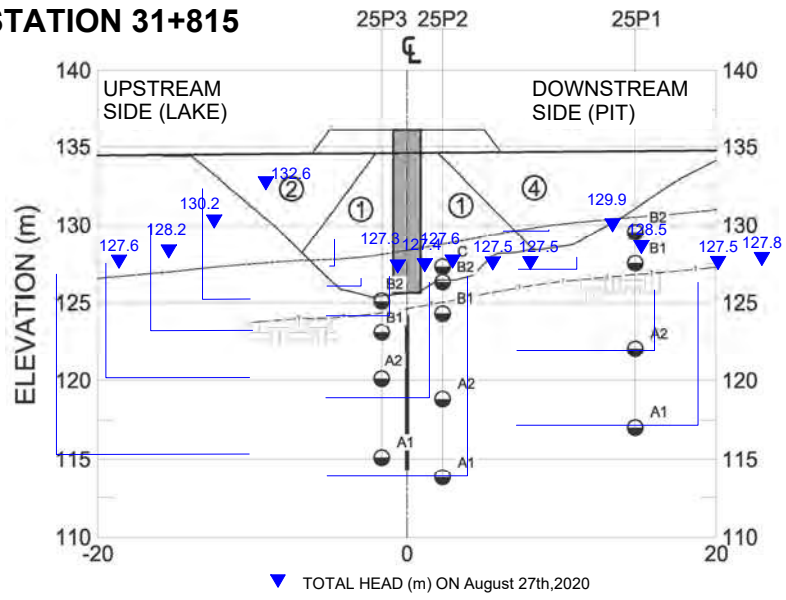
PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

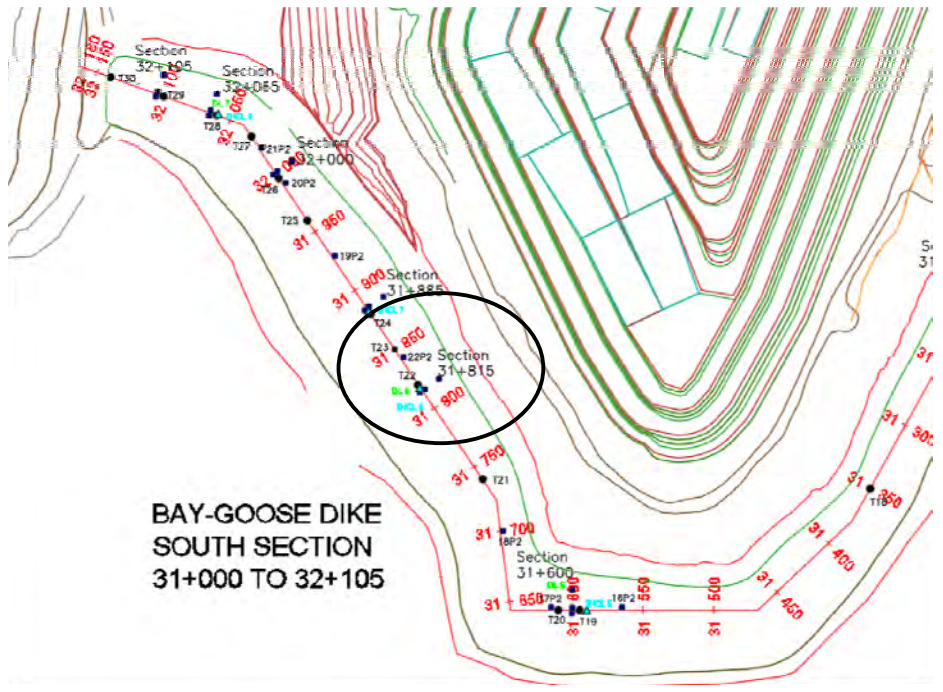
TITLE: BAYGOOSE DIKE
Section 31+815 - CHANNEL 2, PIEZOMETRIC DATA (July 1/11 to Aug 27/20)

AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	FIGURE 15	
REVIEW				

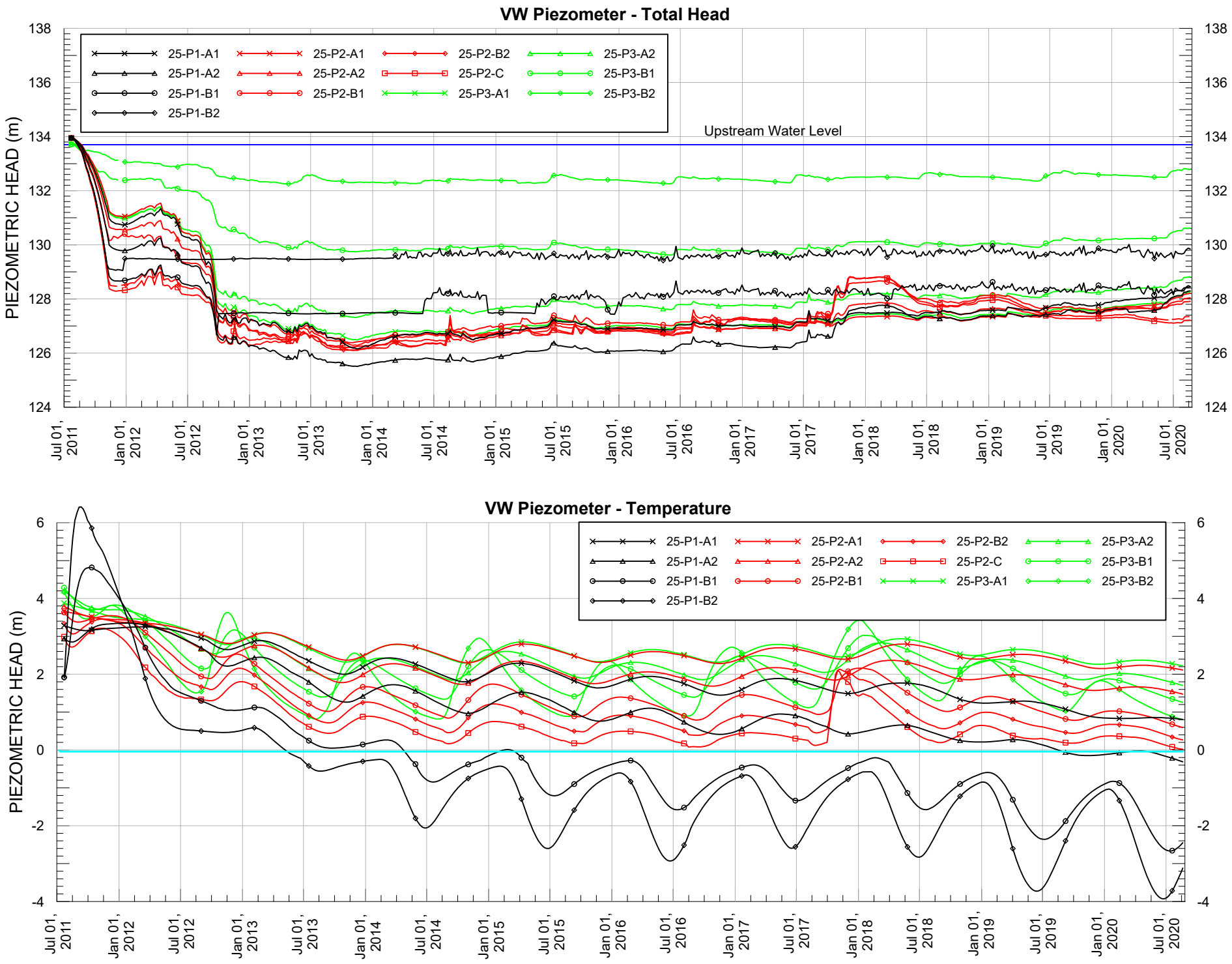
STATION 31+815





LEGEND

- CUTOFF (CSB)
- CUTOFF (SB)
- INITIAL ROCKFILL
- LAKEBED
- BEDROCK
- JET GROUT
- GROUT
- ① CORE BACKFILL (19 mm MINUS)
- ② COARSE BACKFILL (15mm MINUS)
- ③ ROCKFILL
- ④ FINE ROCKFILL



NOTES:

1. **The rise in temperature and PWP was interpreted as the permafrost at the toe of the dike blocking the seepage path which led to this events. Will continue to monitor in the field and the instruments. Since the snow melt the blockage is no longer there and the PWP is on a downtrend.**

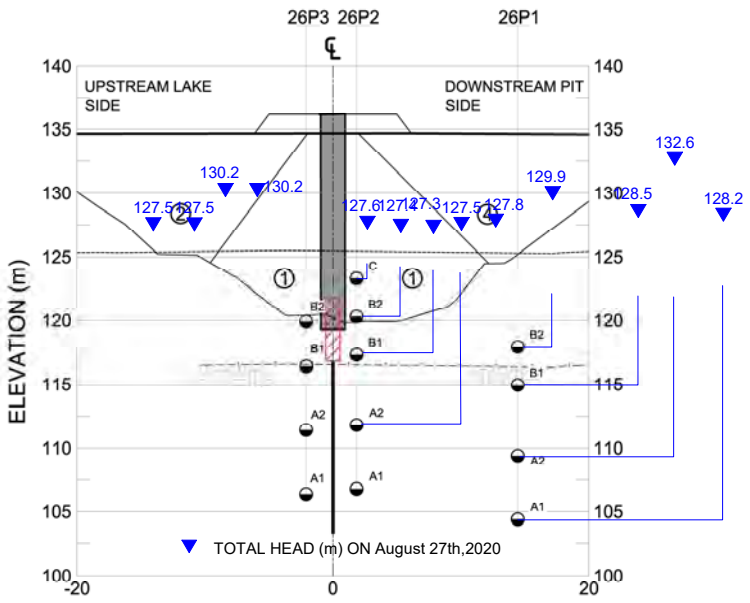
PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAY-GOOSE DIKE - SECTION 31+815 PIEZOMETRIC DATA (July 1/11 to Aug 27/20)

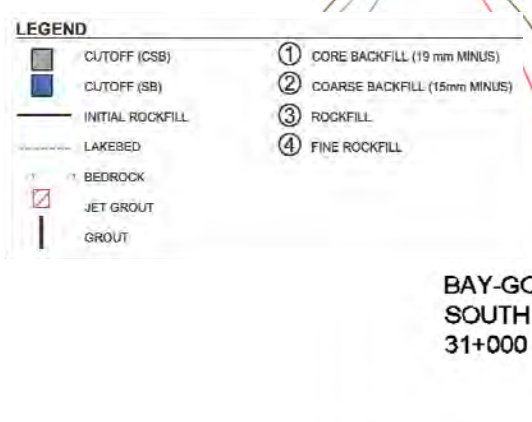
AGNICO EAGLE MEADOWBANK

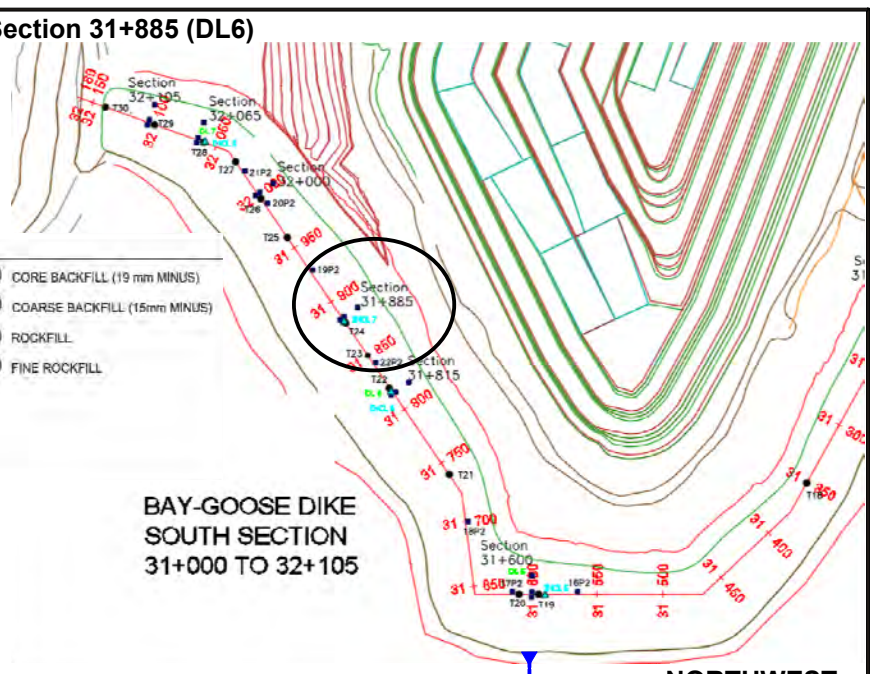
PROJECT No. 09-1478-5007			PHASE No. 4000	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14		
REVIEW				

FIGURE 16

"Channel 2 & Channel 1" Bay-Goose Dike - Section 31+885 (DL6)



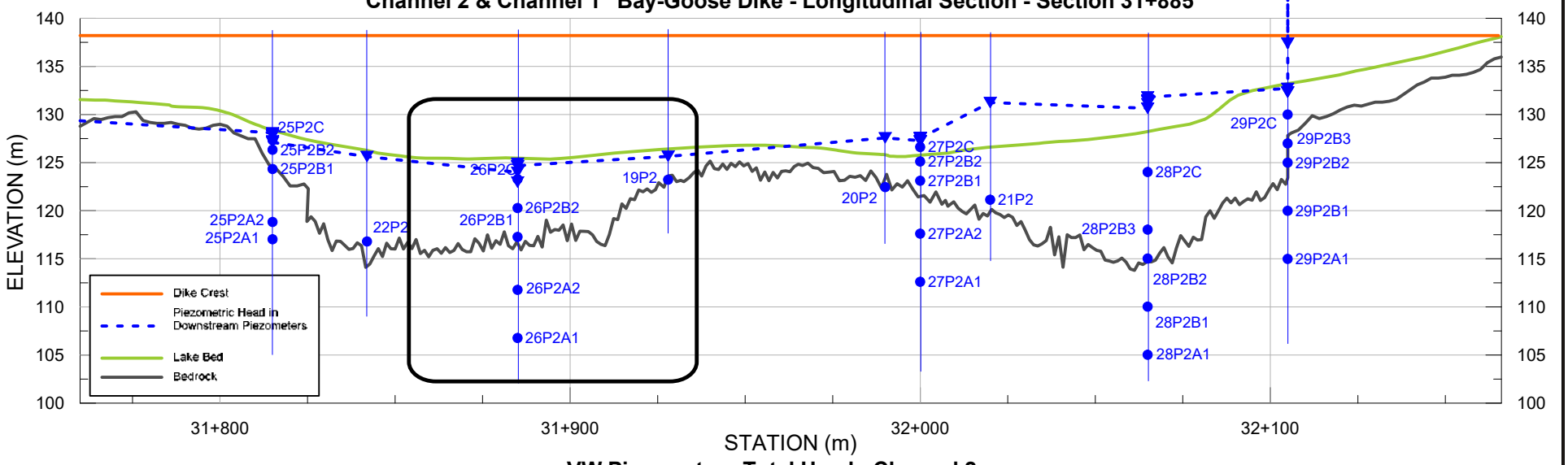




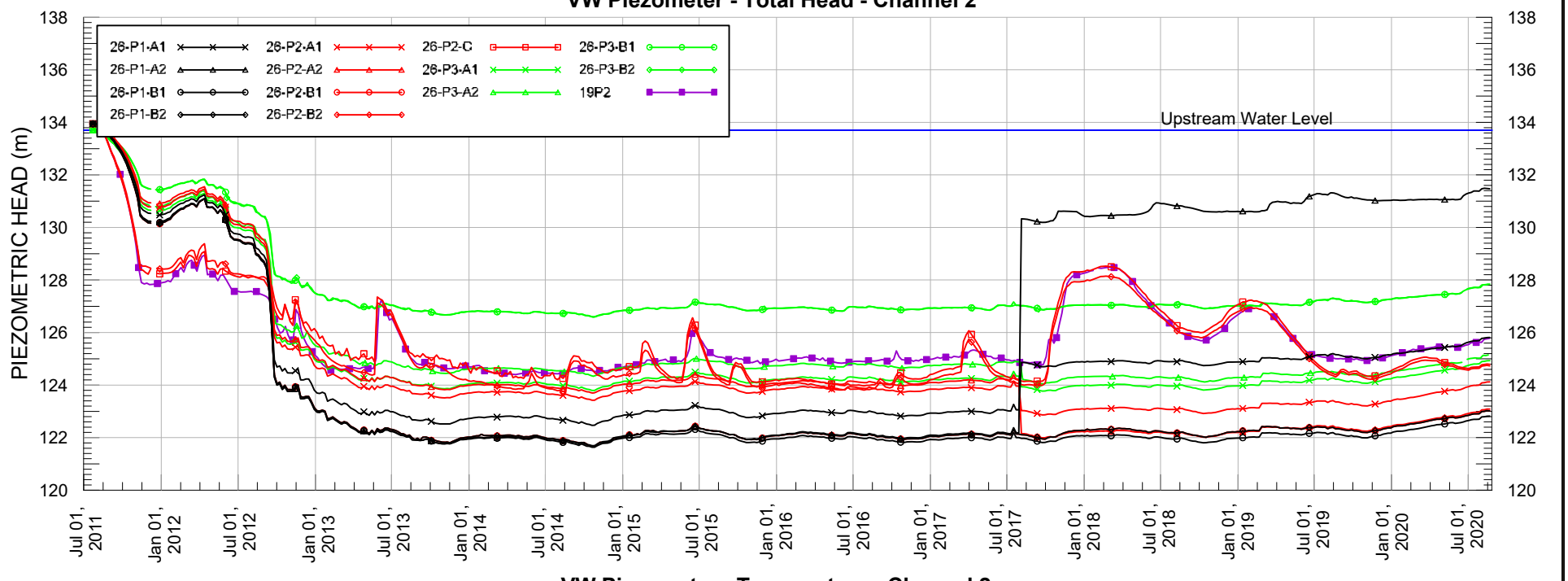
SOUTHEAST

NORTHWEST

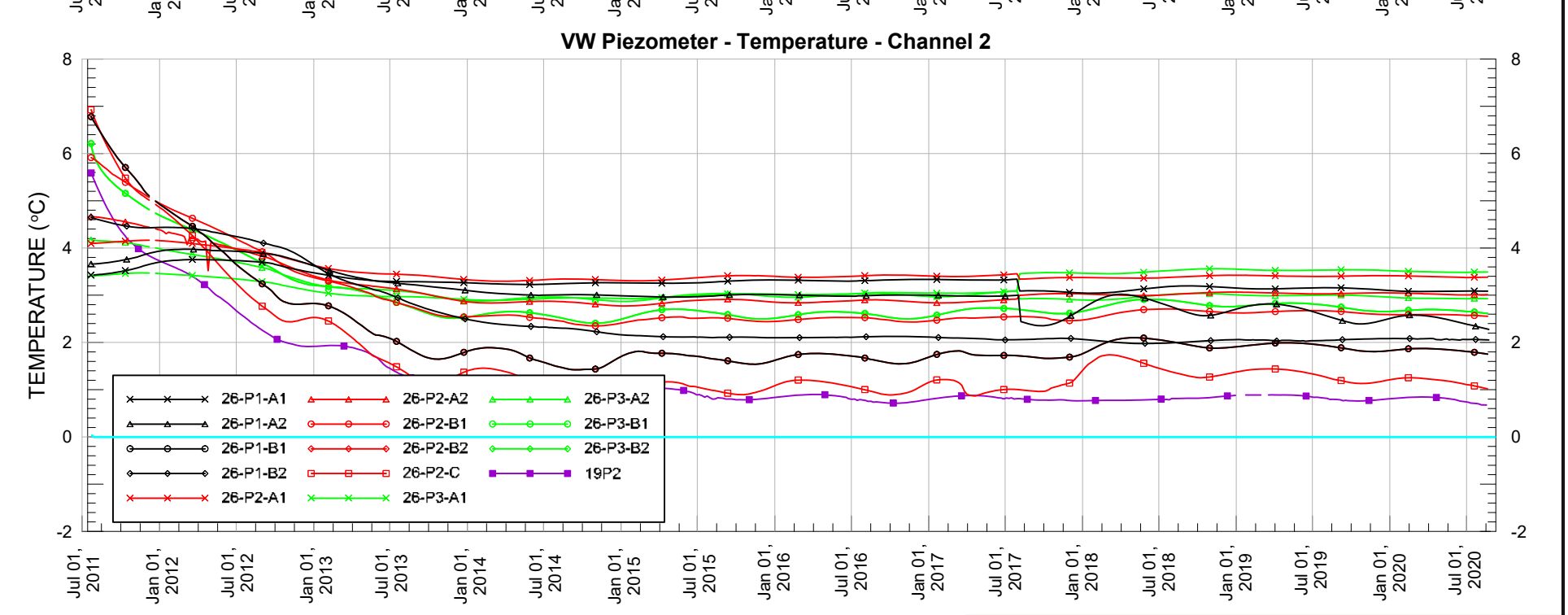
"Channel 2 & Channel 1" Bay-Goose Dike - Longitudinal Section - Section 31+885



VW Piezometer - Total Head - Channel 2



VW Piezometer - Temperature - Channel 2



NOTES:

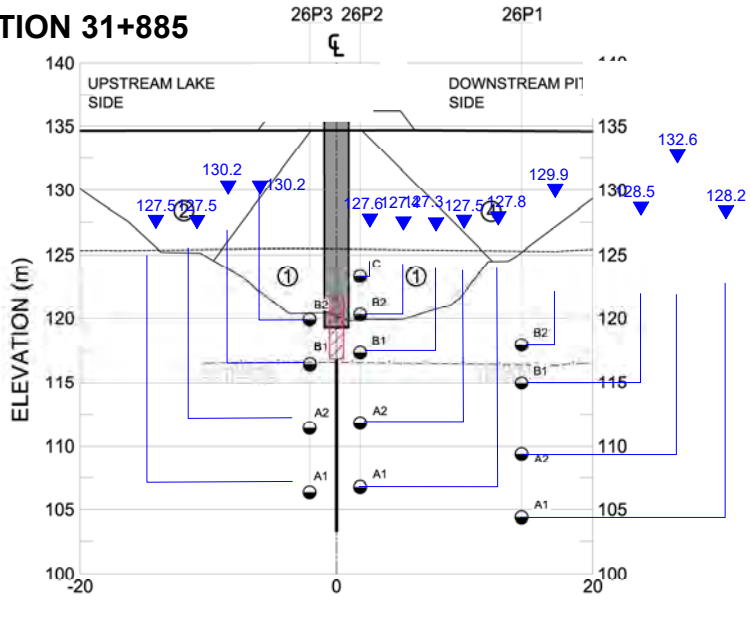
1. The rise and fall in temperature and PWP was interpreted as the permafrost at the toe of the dike blocking the seepage path which led to this events. Will continue to monitor in the field and the instruments.

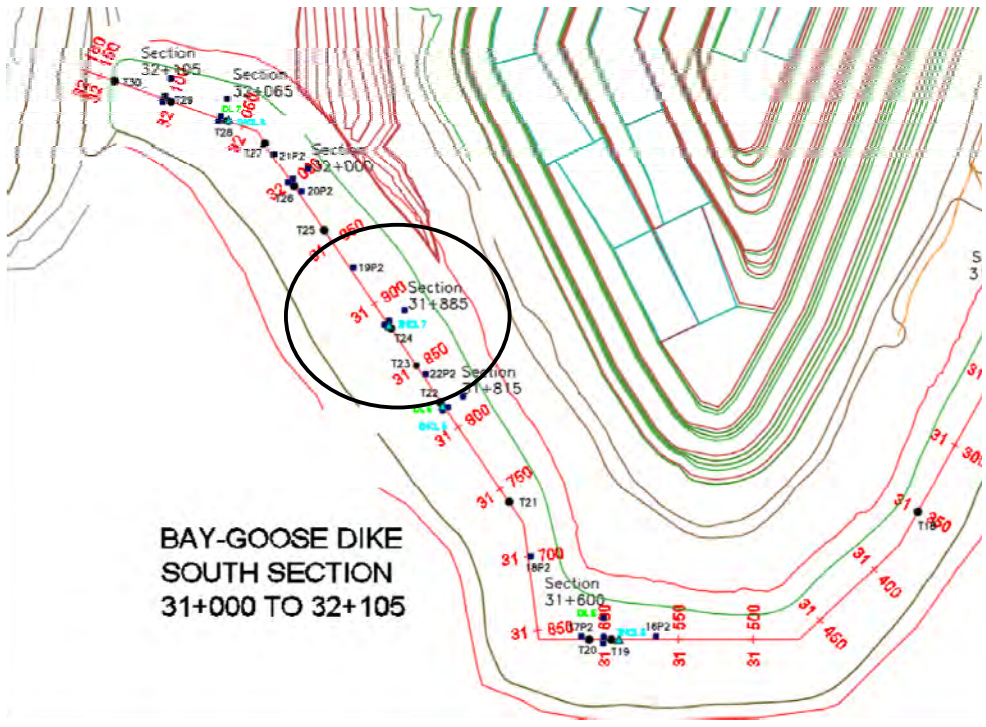
PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE Section 31+885 - CHANNEL 2, PIEZOMETRIC DATA (July 1/11 to Aug 27/20)

AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	FIGURE 17	
REVIEW				

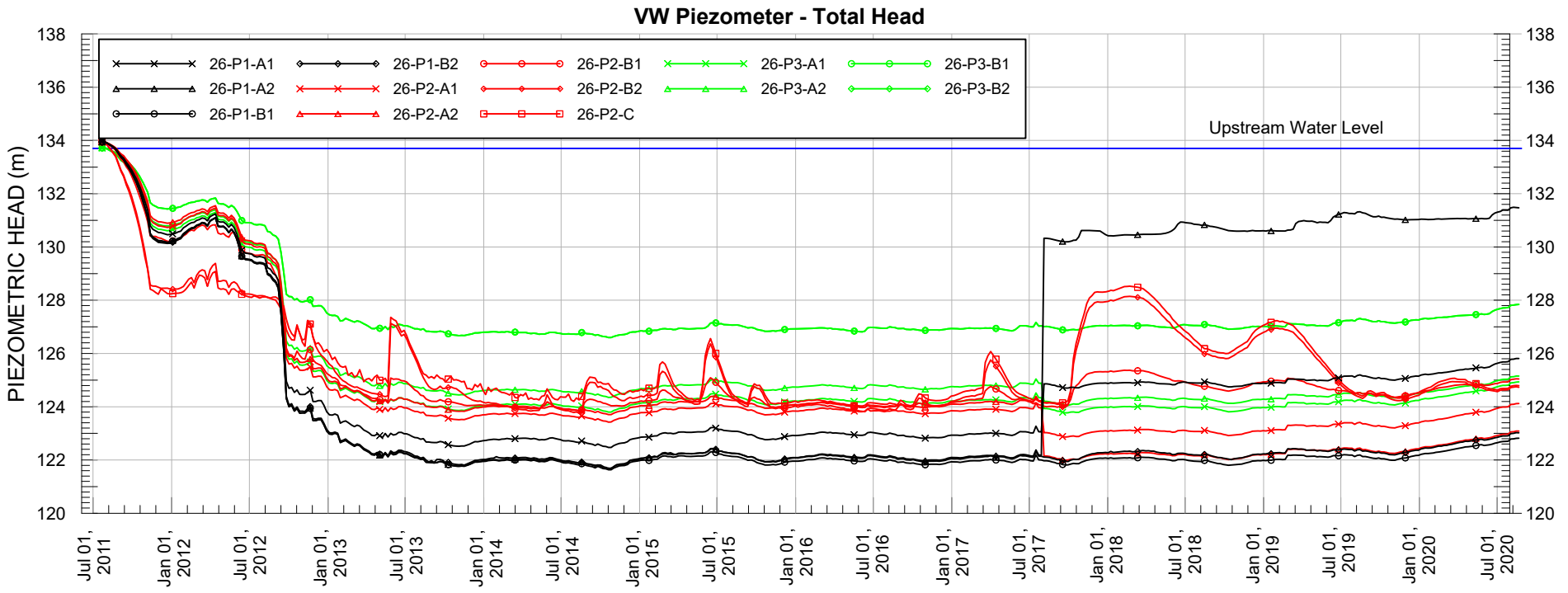
STATION 31+885

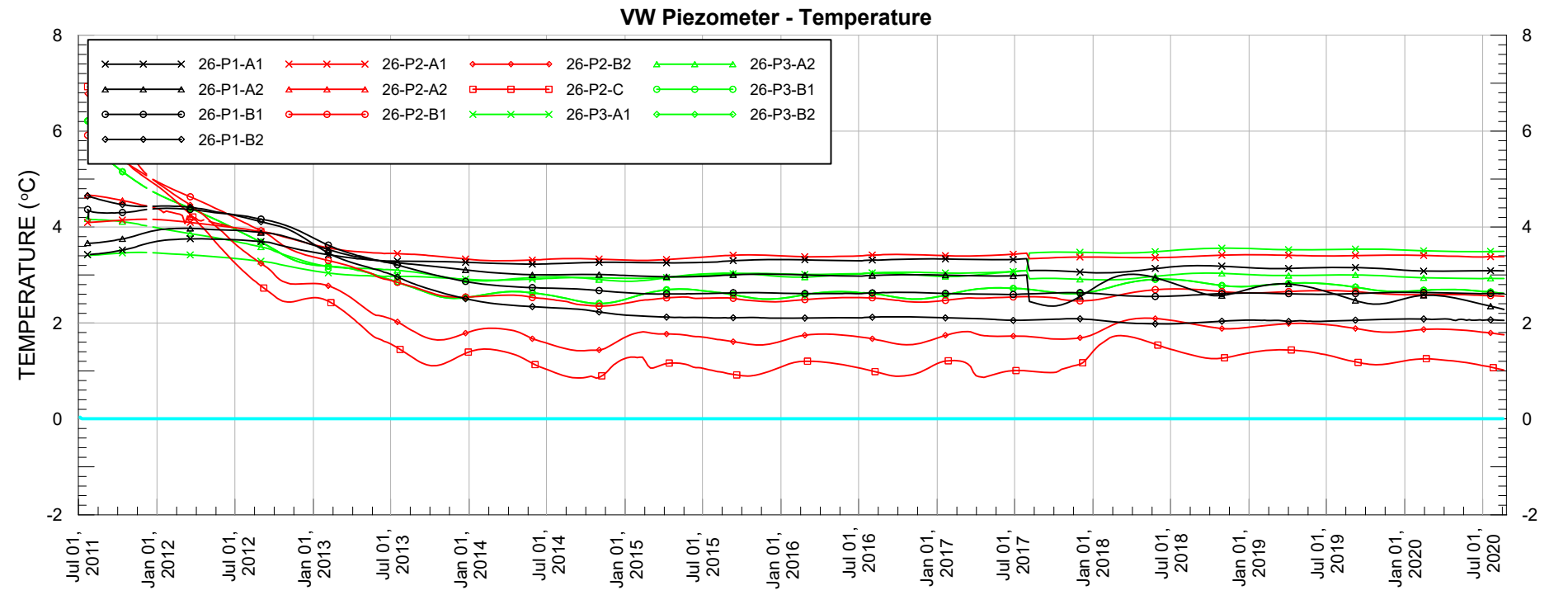




LEGEND

- CUTOFF (CSB)
- CUTOFF (SB)
- INITIAL ROCKFILL
- LAKEBED
- BEDROCK
- JET GROUT
- GROUT
- ① CORE BACKFILL (19 mm MINUS)
- ② COARSE BACKFILL (15mm MINUS)
- ③ ROCKFILL
- ④ FINE ROCKFILL





NOTES:

1. The rise in temperature and PWP was interpreted as the permafrost at the toe of the dike blocking the seepage path which led to this events. Will continue to monitor in the field and the instruments. Now that ice has melted the PWP has decreased as the seepage path is no longer blocked.

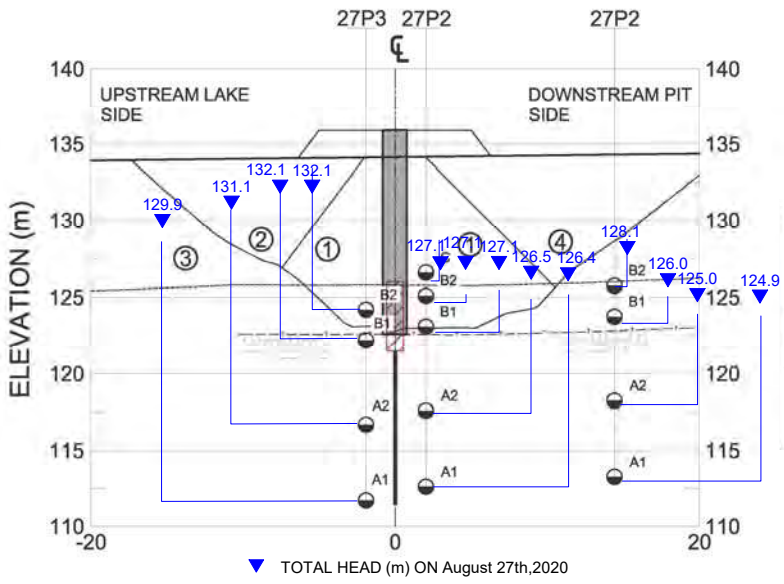
PROJECT: **AGNICO EAGLE MINES LIMITED**
MEADOWBANK GOLD PROJECT
NUNAVUT

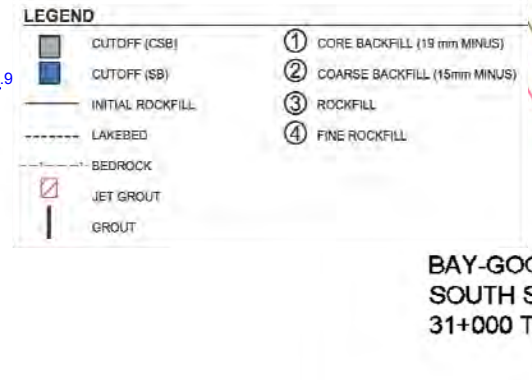
TITLE: **BAYGOOSE DIKE - SECTION 31+885**
PIEZOMETRIC DATA
(July 1/11 to Aug 27/20)

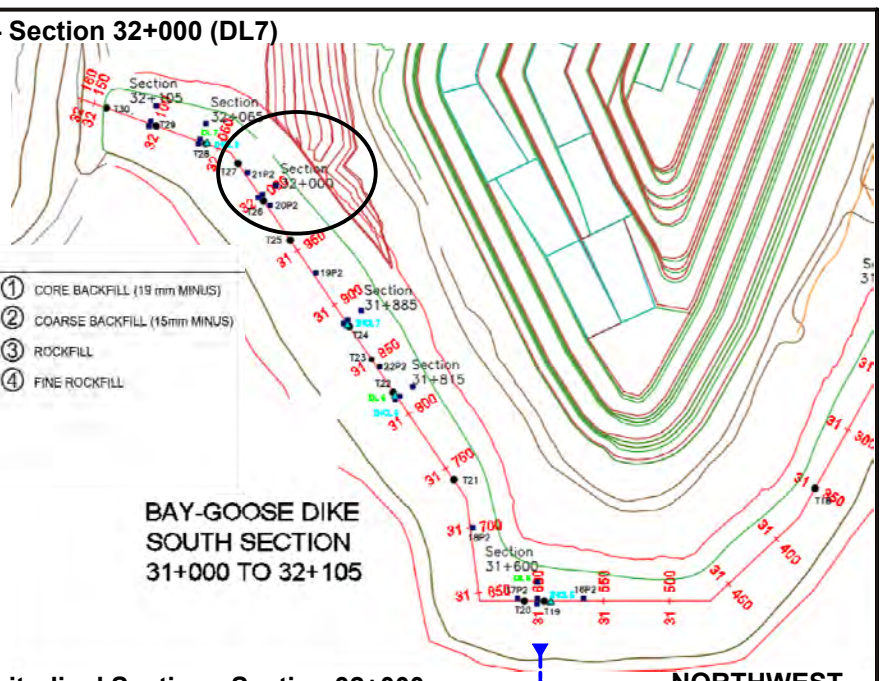
AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.
DESIGN	TD	28AUG14	SCALE AS SHOWN REV.
CADD	TD	28AUG14	
CHECK	PG	28AUG14	**FIGURE 18**
REVIEW			

"Channel 2 & Channel 1" Bay-Goose Dike - Section 32+000 (DL7)

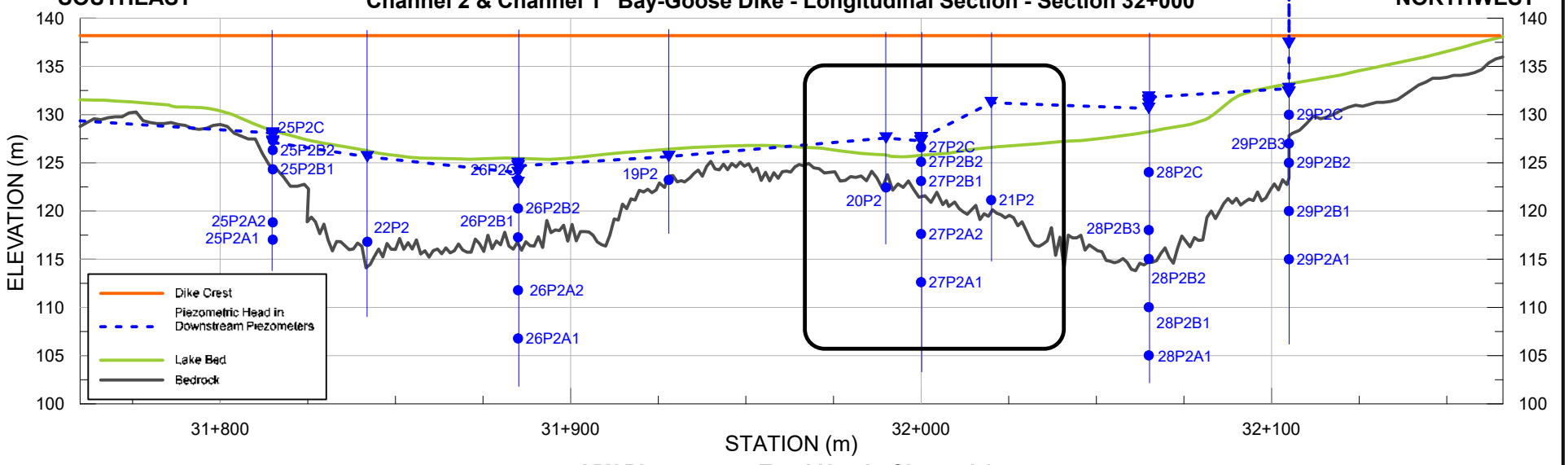




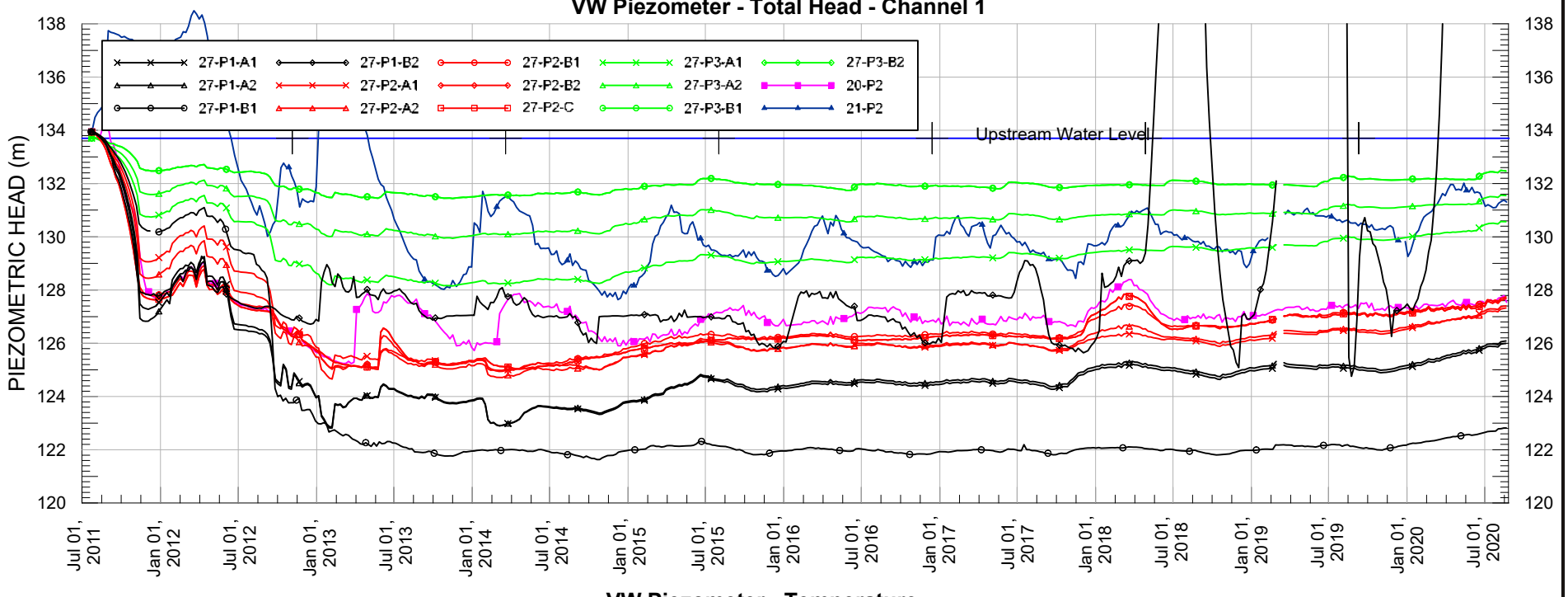


"Channel 2 & Channel 1" Bay-Goose Dike - Longitudinal Section - Section 32+000

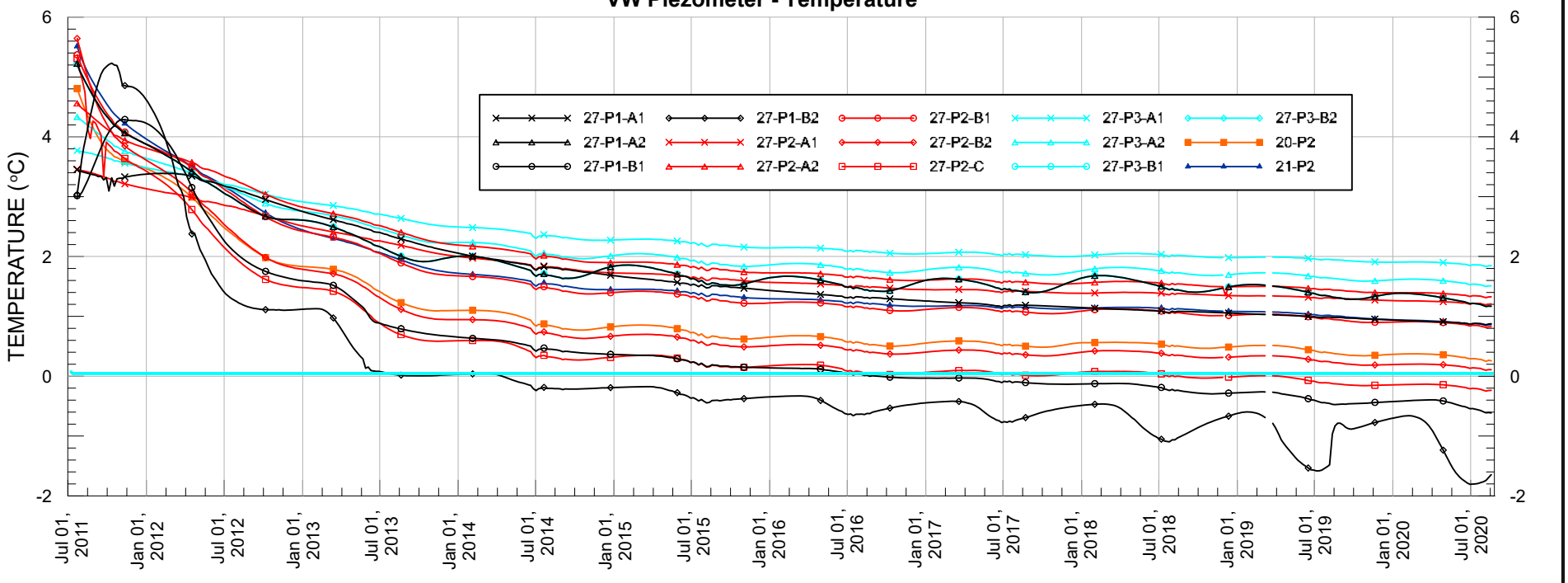
SOUTHEAST NORTHWEST



VW Piezometer - Total Head - Channel 1



VW Piezometer - Temperature



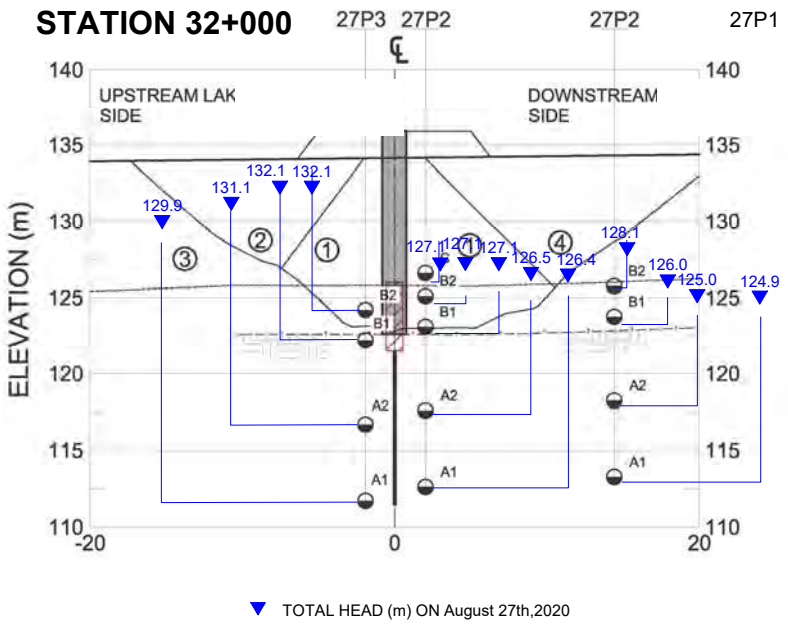
NOTES:

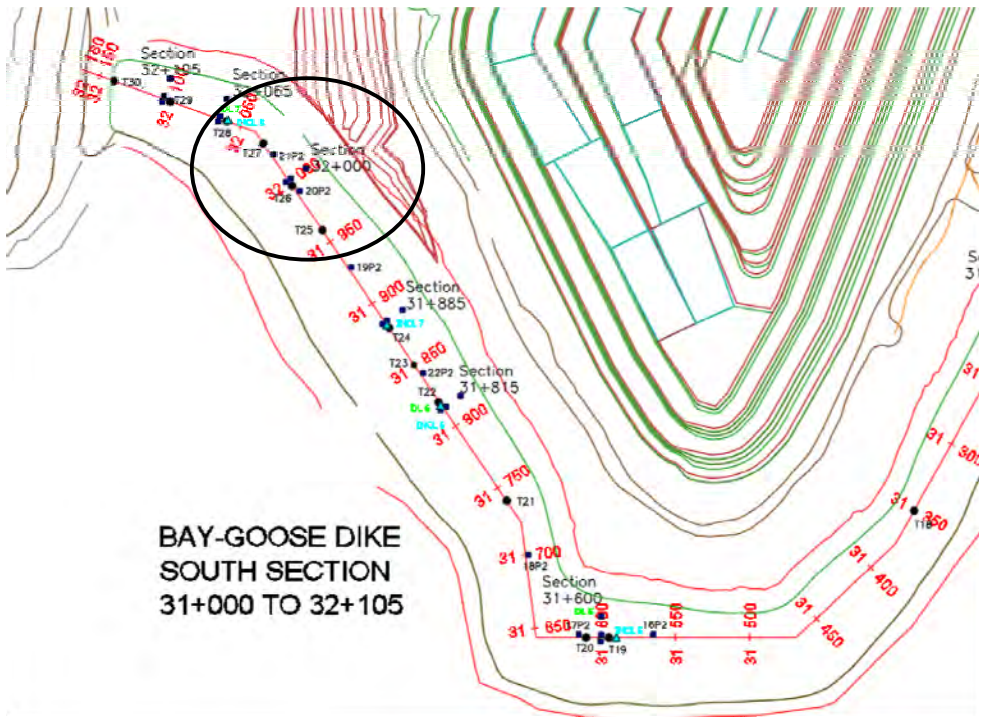
1. With the spike PWP pressure in 27-P1-B2 it is assumed that this instrument is not functioning anymore as the PWP pressure is higher than the lake elevation.

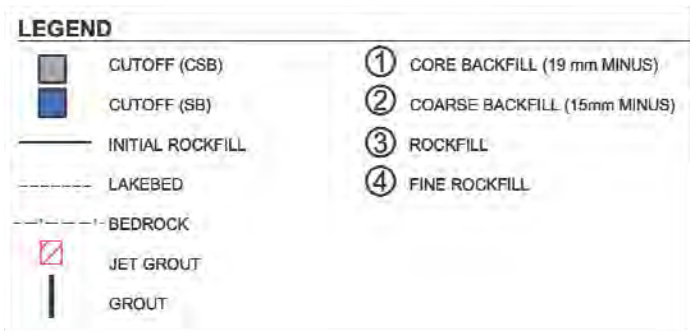
PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE CHANNEL 1, PIEZOMETRIC DATA SECTION 32+000 (July 1/11 to Aug 27/20)

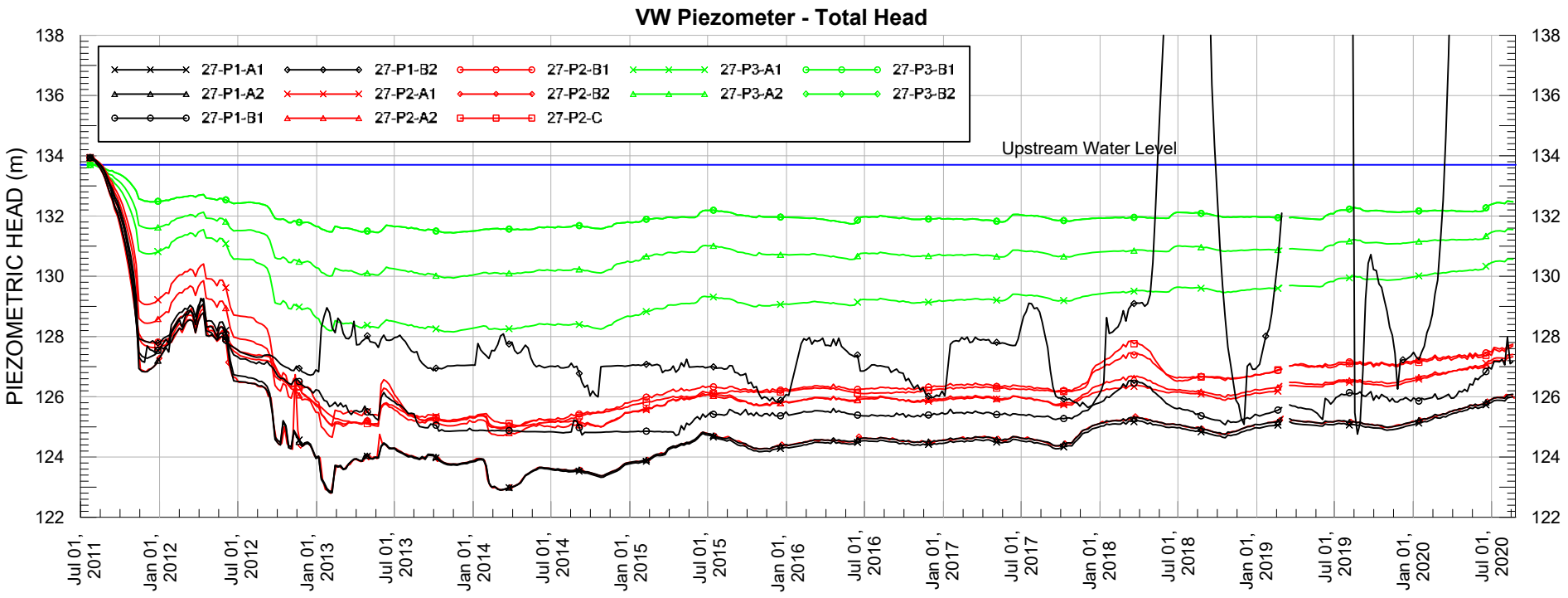
AGNICO EAGLE MEADOWBANK

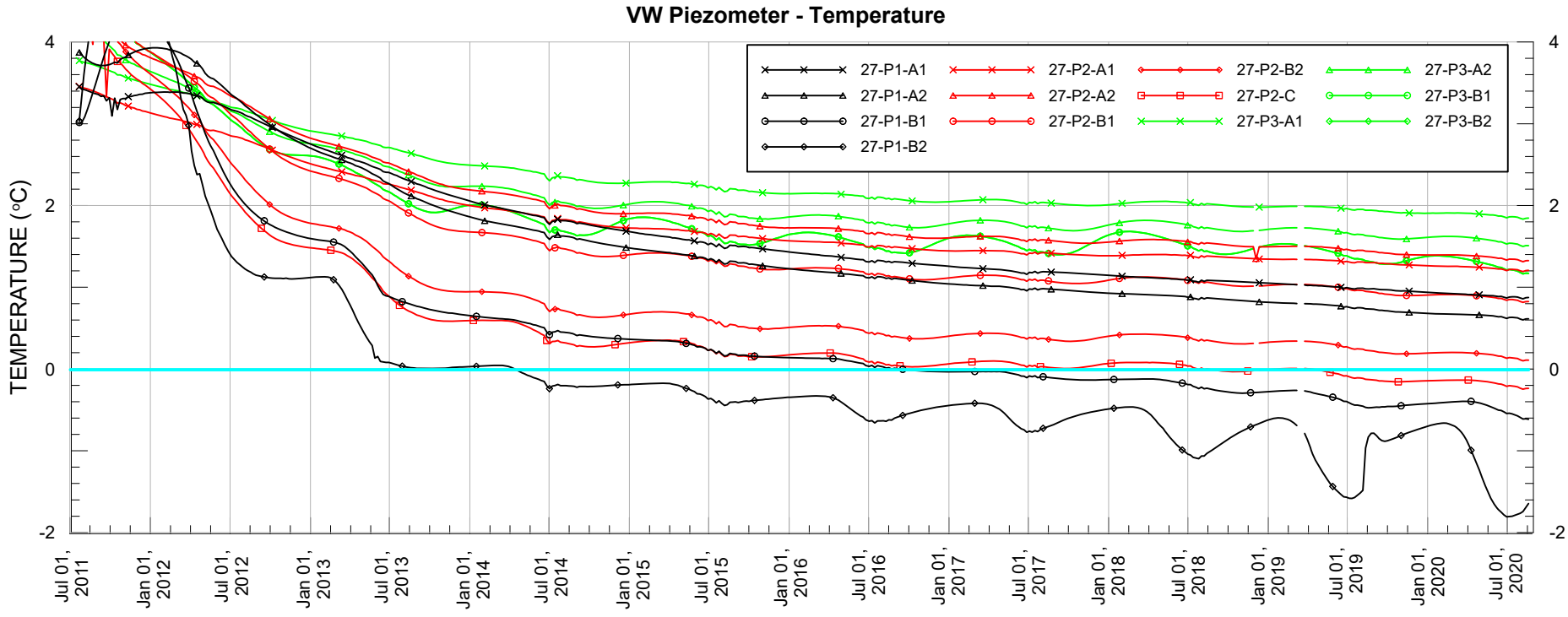
PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14	FIGURE 19	
CHECK	PG	28AUG14		
REVIEW				











NOTES:
1. With the spike PWP pressure in 27-P1-B2 it is assumed that this instrument is not functioning anymore as the PWP pressure is higher than the lake elevation.

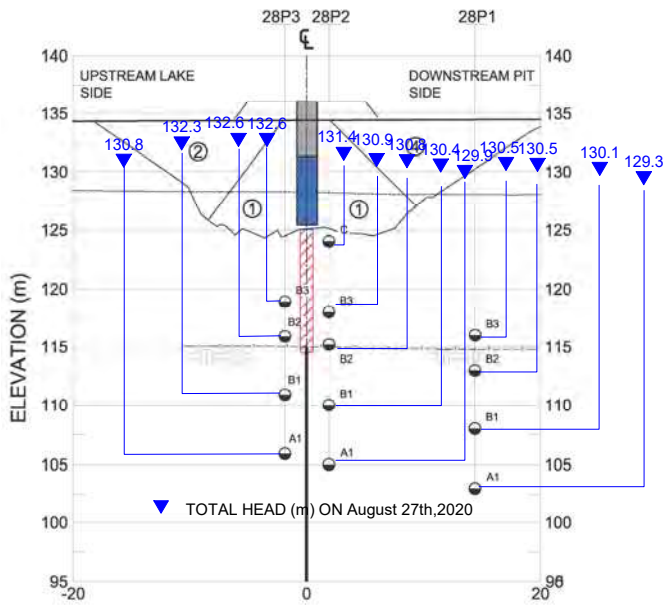
PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAY OOSE DIKE - SECTION 32+000 PIEZOMETRIC DATA (July 1/11 to Aug 27/20)

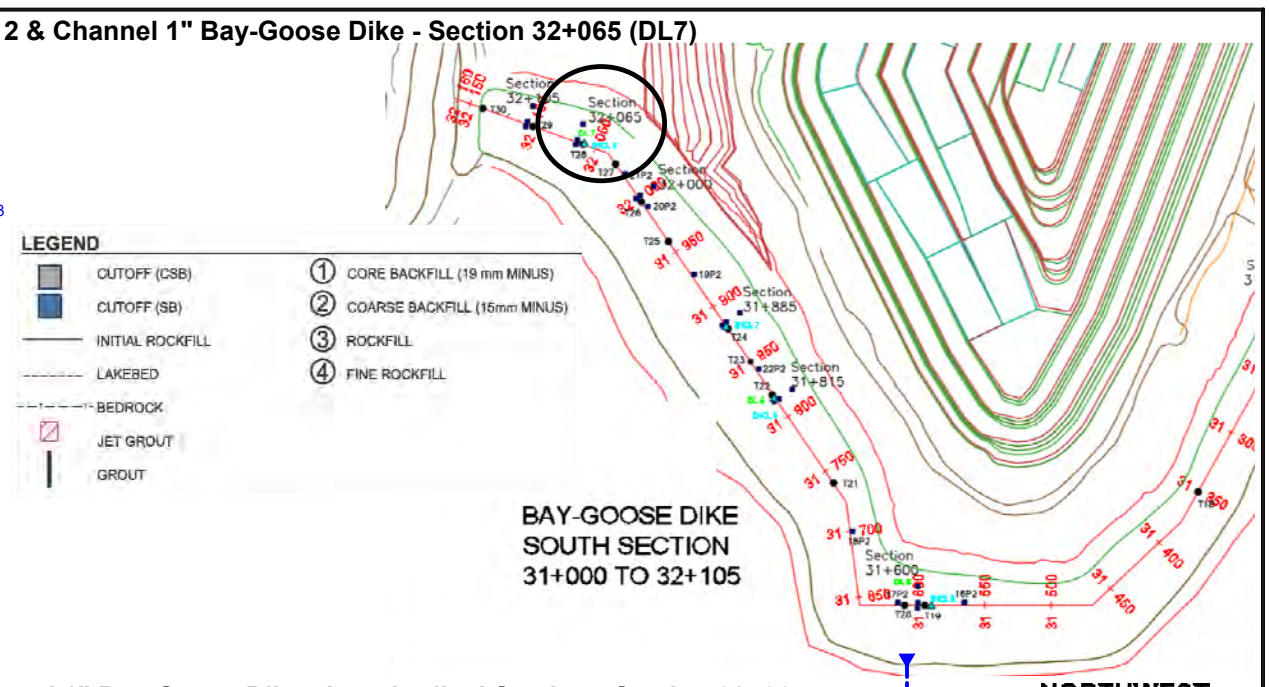
AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14		
REVIEW				

FIGURE 20

"Channel 2 & Channel 1" Bay-Goose Dike - Section 32+065 (DL7)

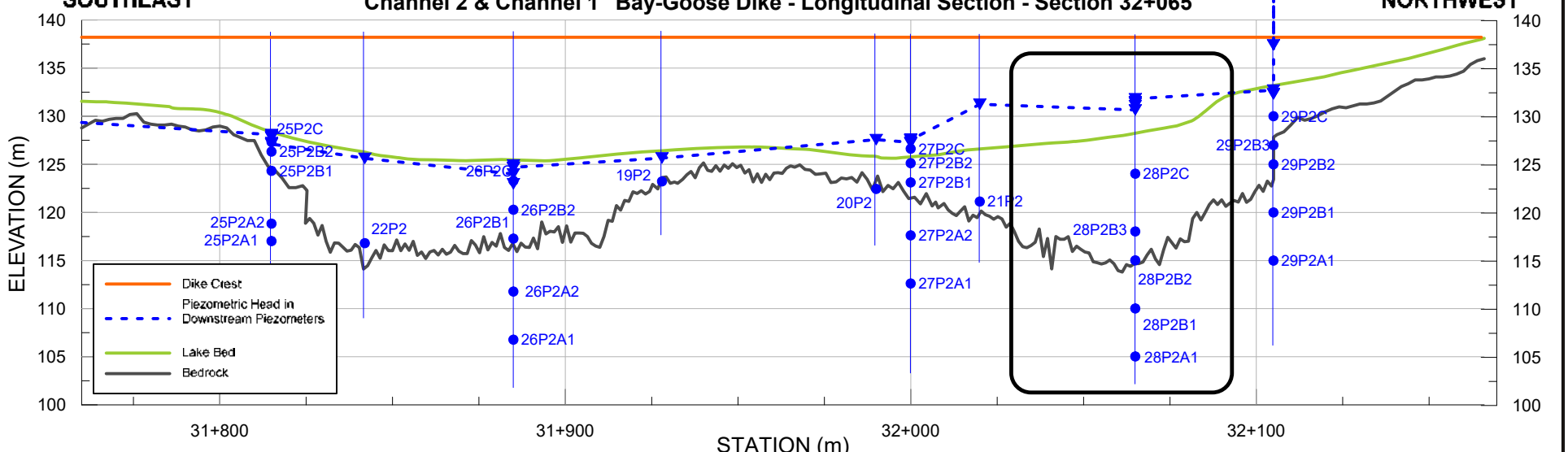




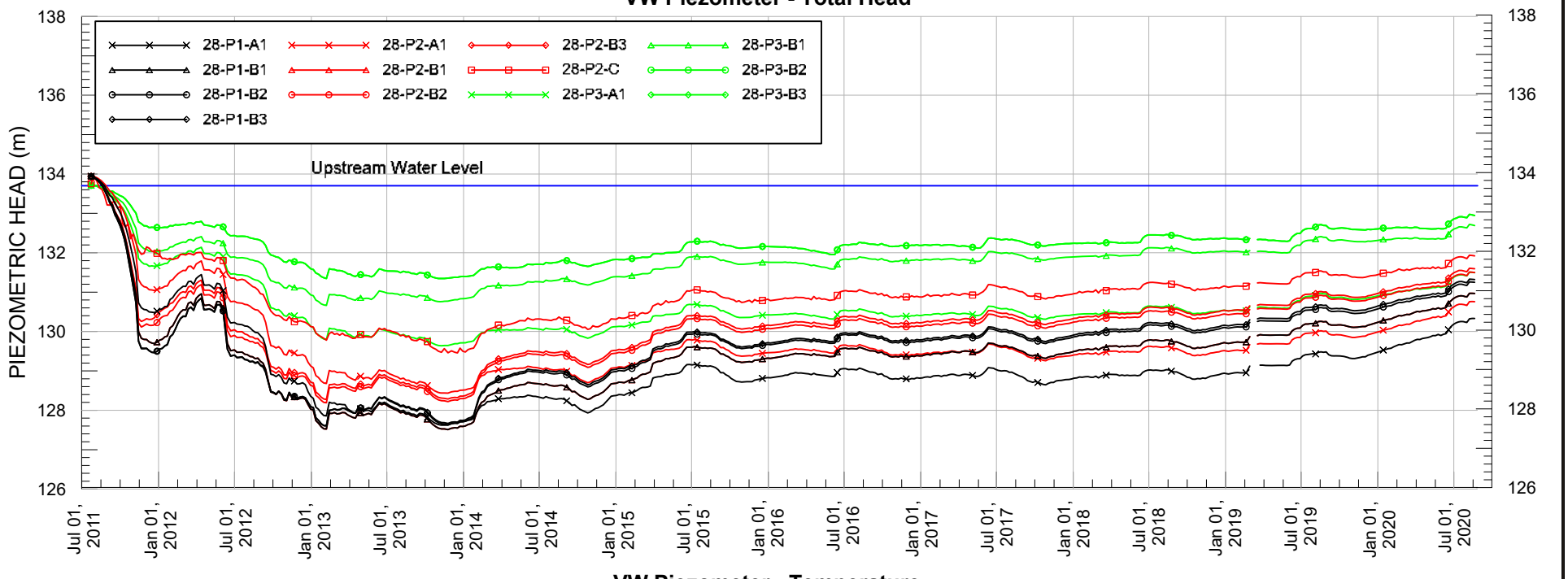
SOUTHEAST

"Channel 2 & Channel 1" Bay-Goose Dike - Longitudinal Section - Section 32+065

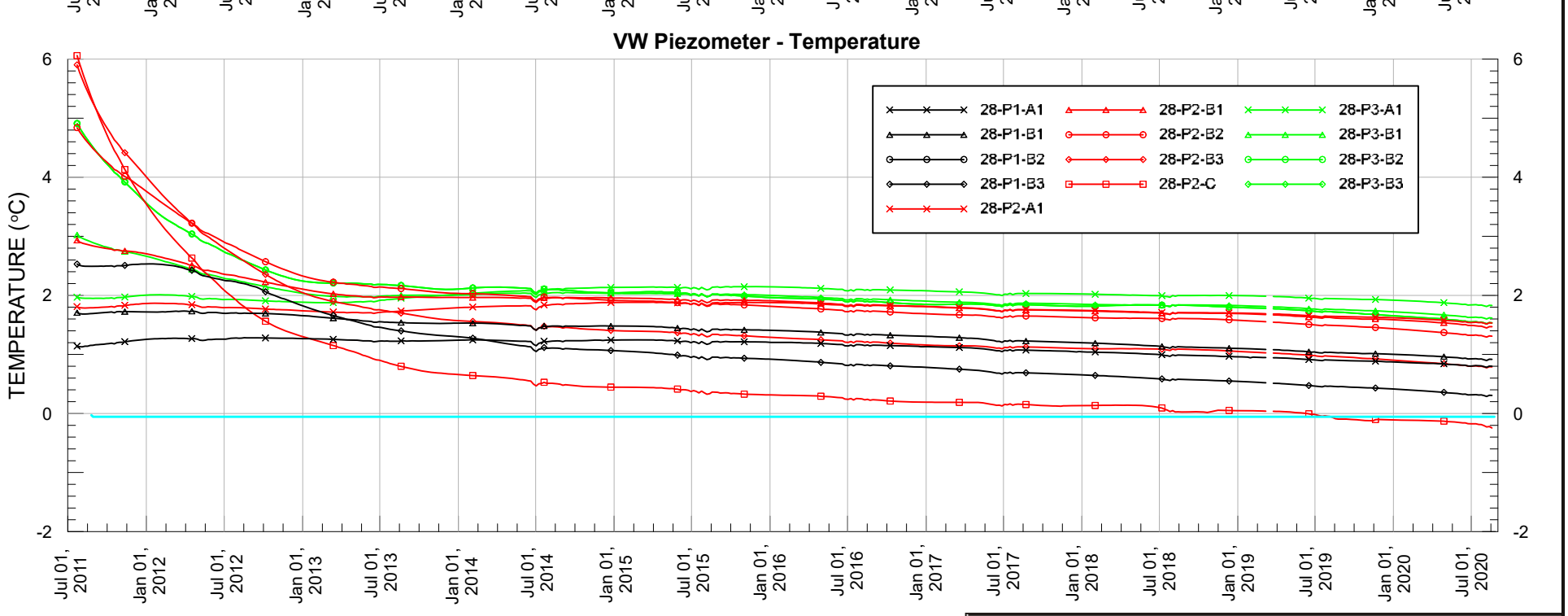
NORTHWEST



VW Piezometer - Total Head



VW Piezometer - Temperature



NOTES:
1.

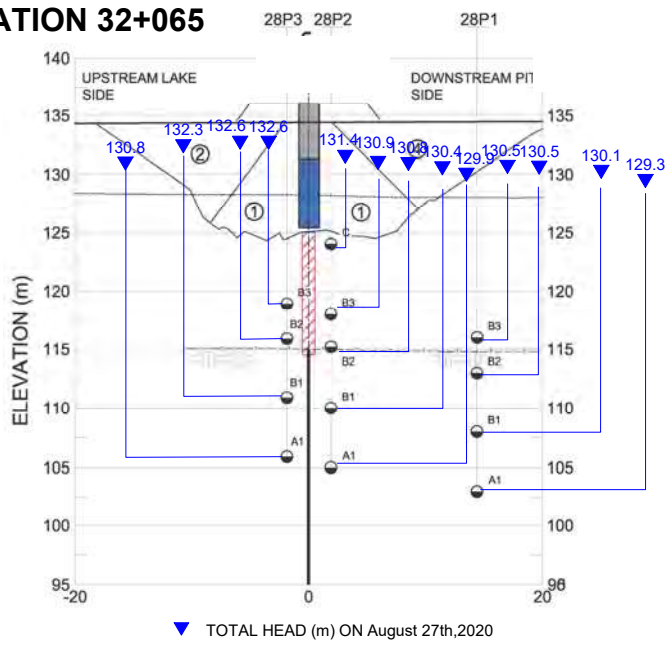
PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE: BAYGOOSE DIKE
Section 32+065 - CHANNEL 1, PIEZOMETRIC DATA (July 1/11 to Aug 27/20)

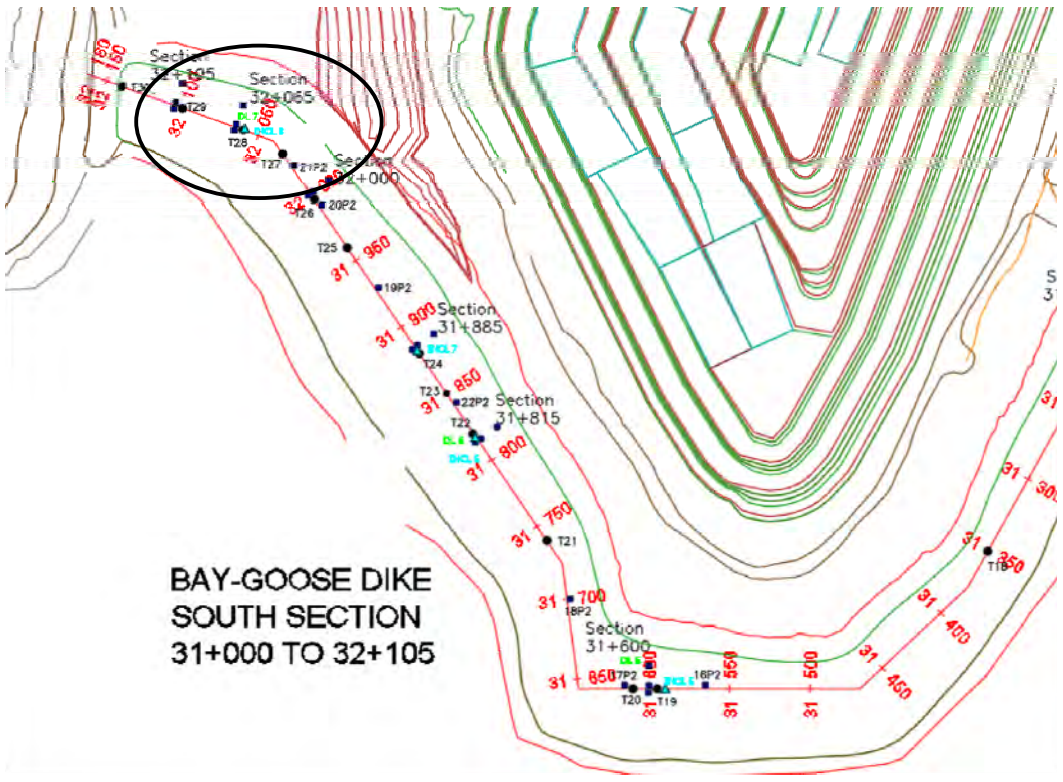
AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	FIGURE 21	
REVIEW				

STATION 32+065

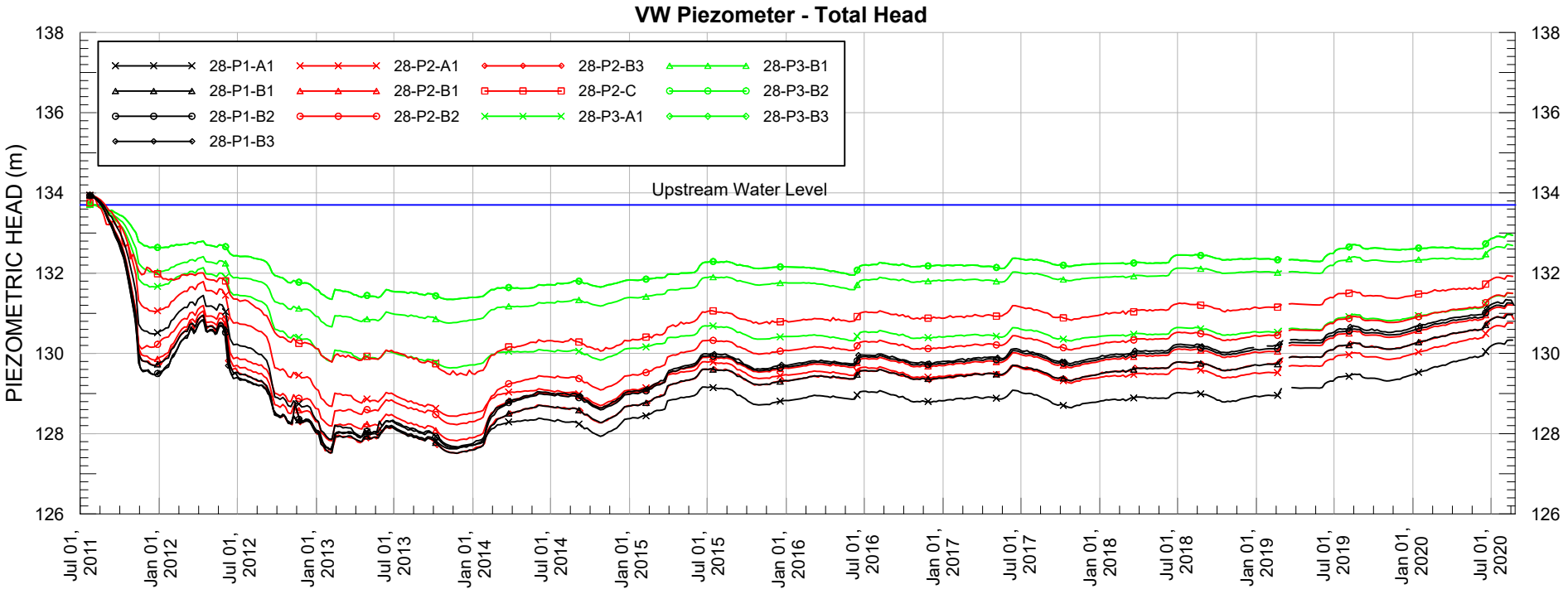


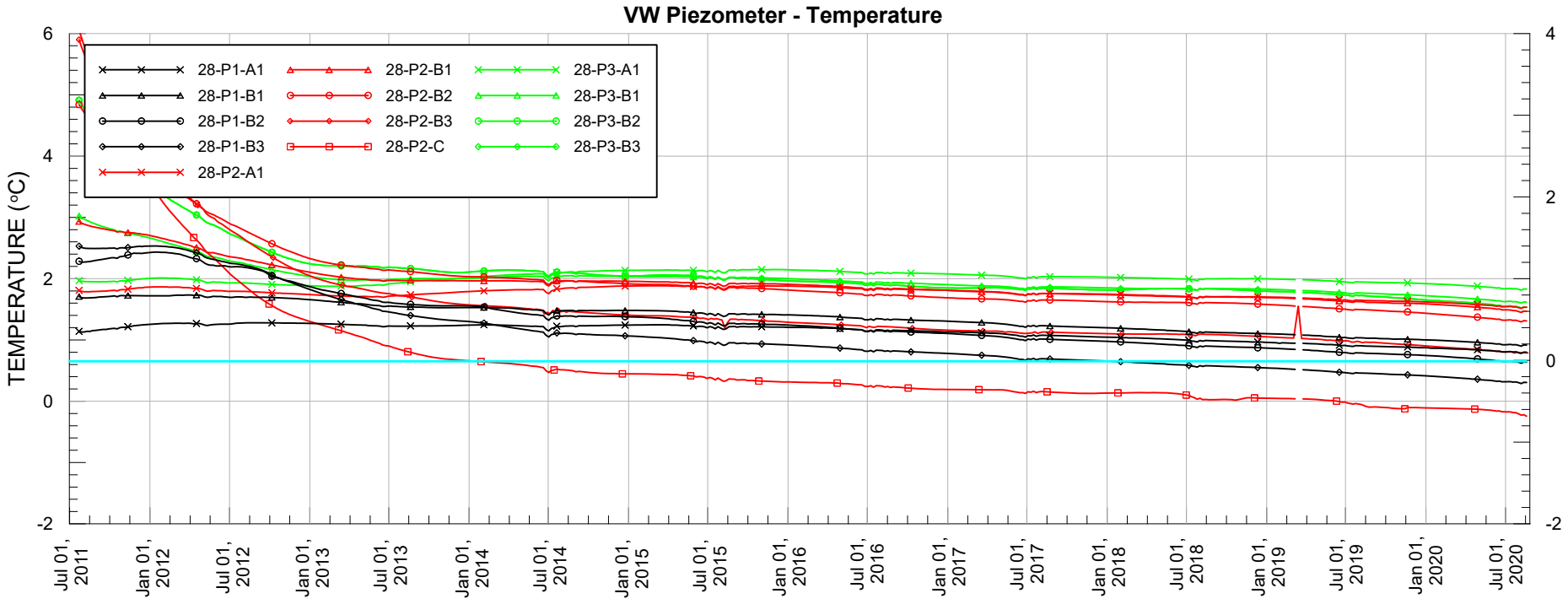
▼ TOTAL HEAD (m) ON August 27th,2020



LEGEND

- CUTOFF (CSB)
- CUTOFF (SB)
- INITIAL ROCKFILL
- LAKEBED
- BEDROCK
- JET GROUT
- GROUT
- ① CORE BACKFILL (19 mm MINUS)
- ② COARSE BACKFILL (15mm MINUS)
- ③ ROCKFILL
- ④ FINE ROCKFILL





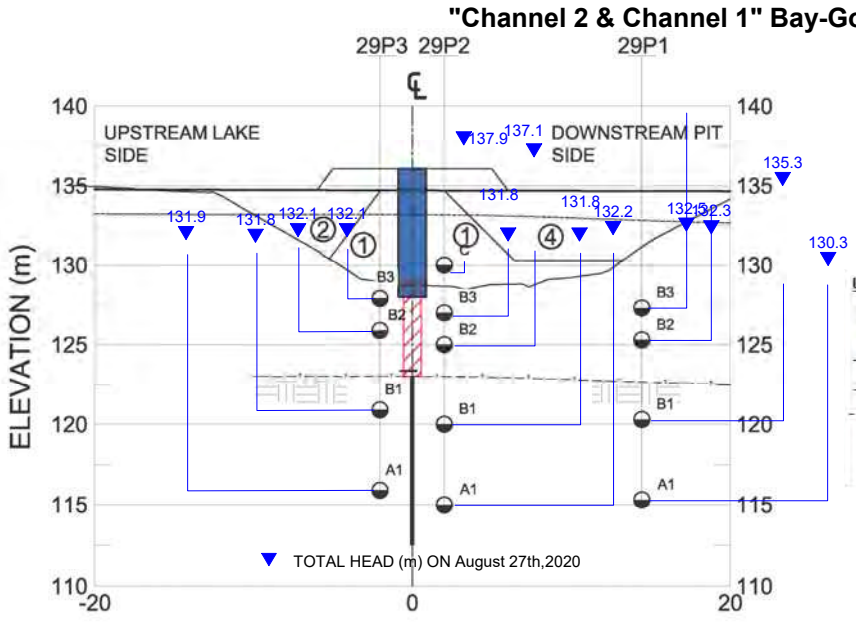
NOTES:
1

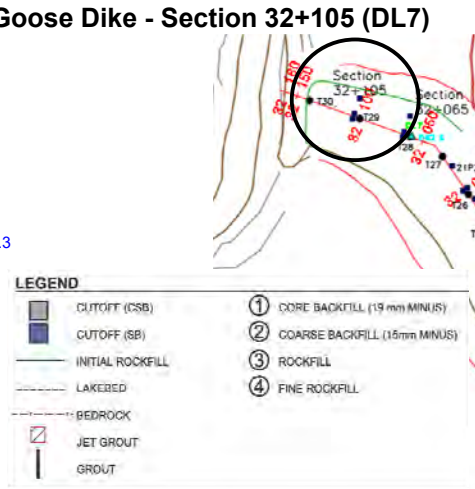
PROJECT	**AGNICO EAGLE MINES LIMITED** **MEADOWBANK GOLD PROJECT** **NUNAVUT**
TITLE	**BAYGOOSE DIKE - SECTION 32+065** **PIEZOMETRIC DATA** **(July 1/11 to Aug 27/20)**

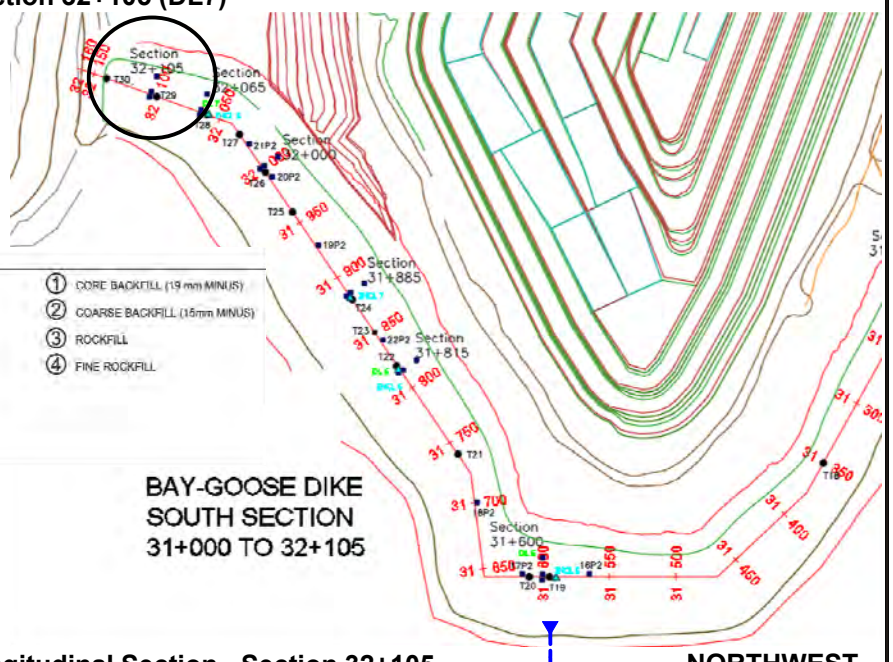
AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	**FIGURE 22**	
REVIEW				

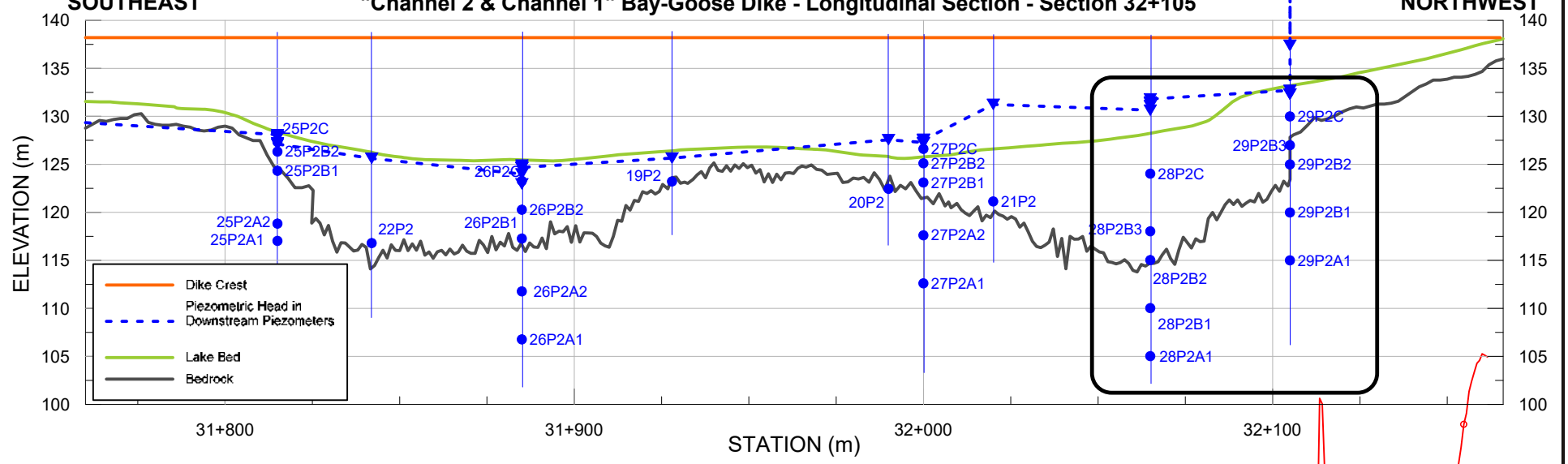
"Channel 2 & Channel 1" Bay-Goose Dike - Section 32+105 (DL7)



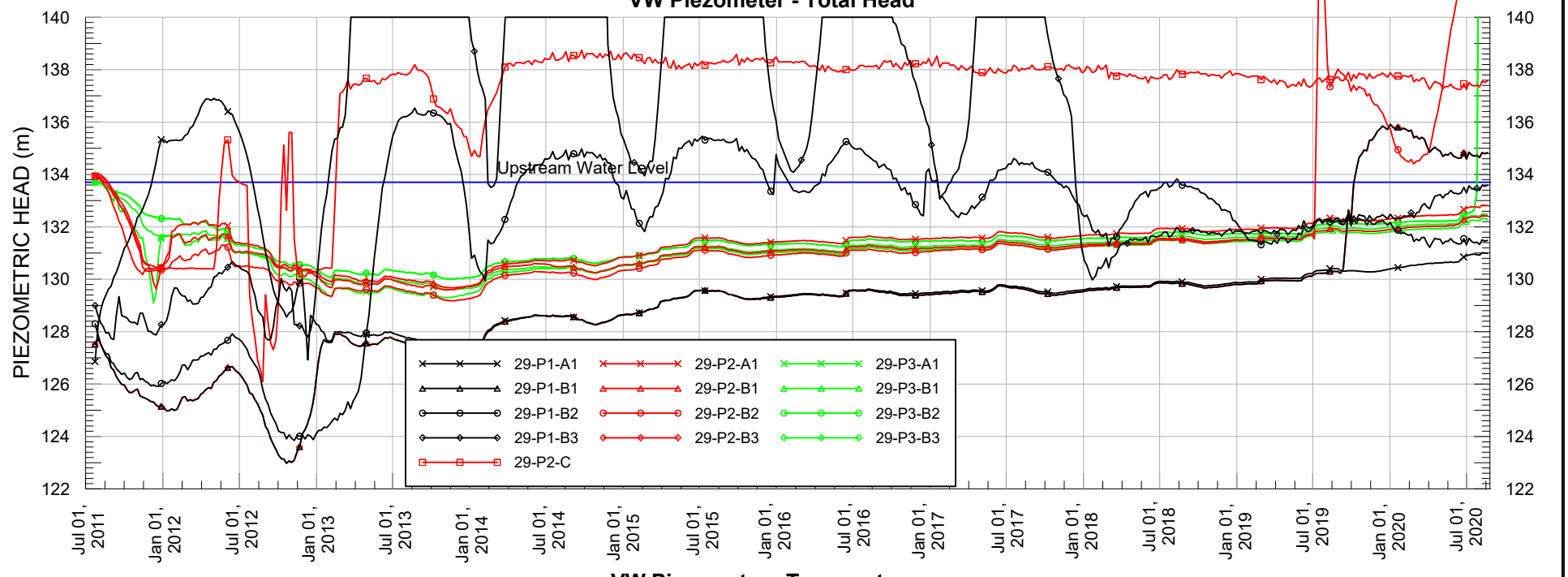




"Channel 2 & Channel 1" Bay-Goose Dike - Longitudinal Section - Section 32+105



VW Piezometer - Total Head



VW Piezometer - Temperature

NOTES:
1. 29P1B2, 29P1B3, 29P2B3, 29P3B3 and 29P2C are given unstable readings and since the temperature shows a negative reading it is assumed to be frozen.

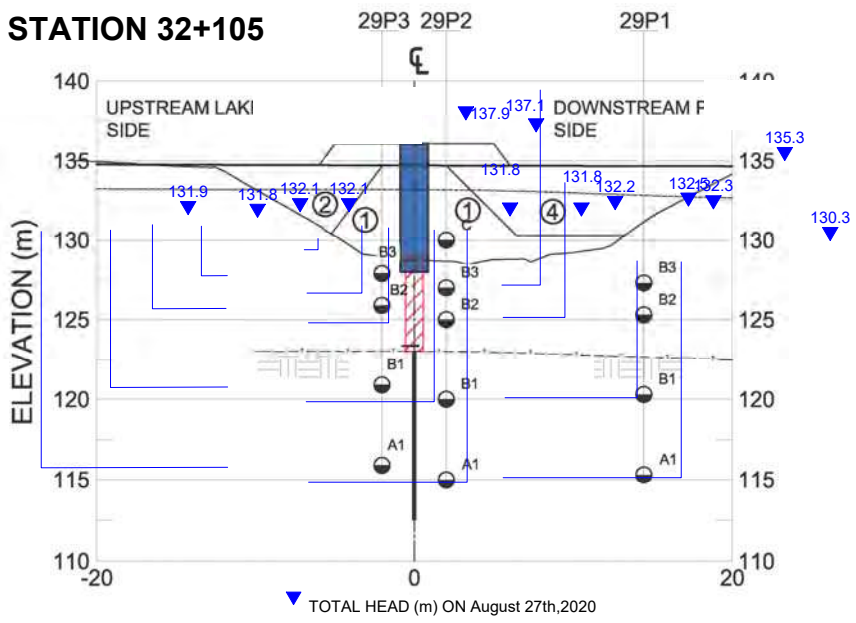
PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

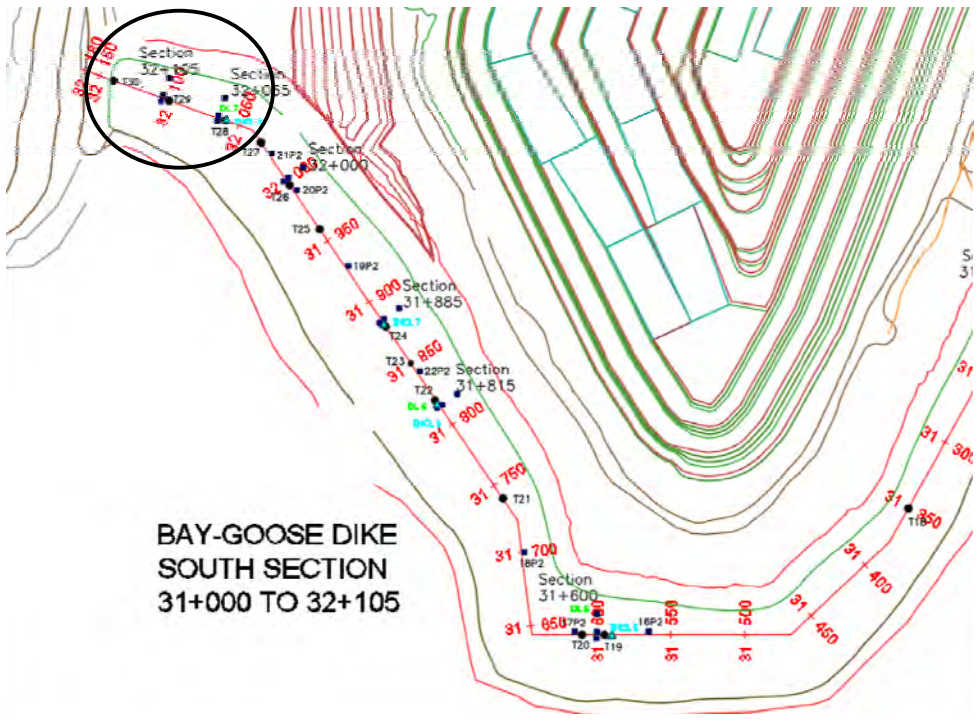
TITLE: BAYGOOSE DIKE
Station 32+105 - CHANNEL 1, PIEZOMETRIC DATA (July 1/11 to Aug 27/20)

AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	FIGURE 23	
REVIEW				

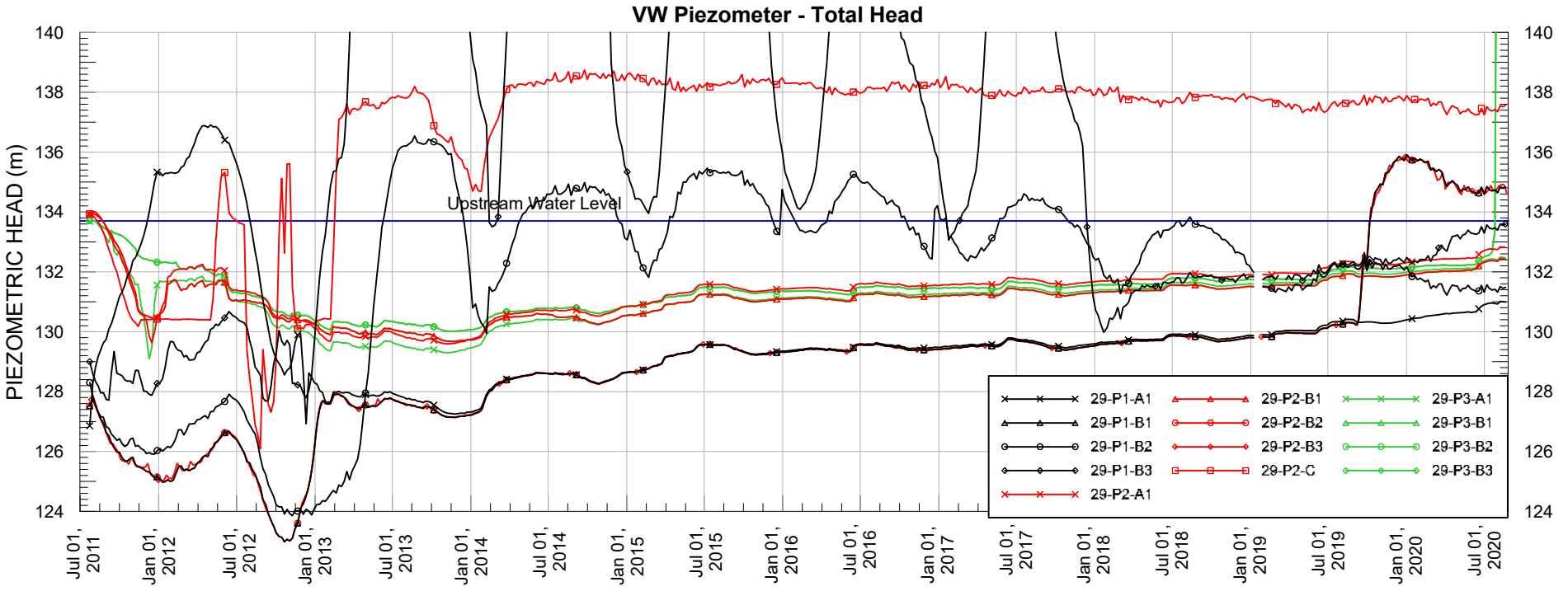
STATION 32+105

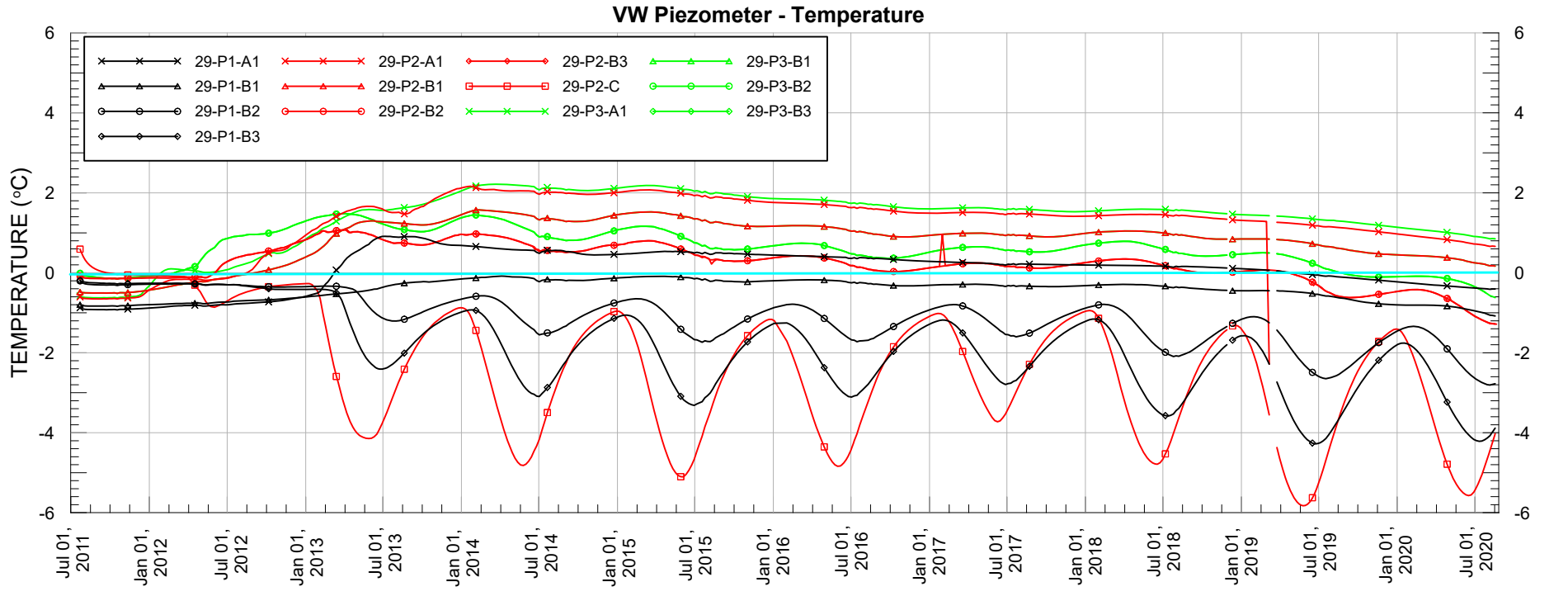




LEGEND

- CUTOFF (CSB)
- CUTOFF (SB)
- INITIAL ROCKFILL
- LAKEBED
- BEDROCK
- JET GROUT
- GROUT
- ① CORE BACKFILL (19 mm MINUS)
- ② COARSE BACKFILL (15mm MINUS)
- ③ ROCKFILL
- ④ FINE ROCKFILL



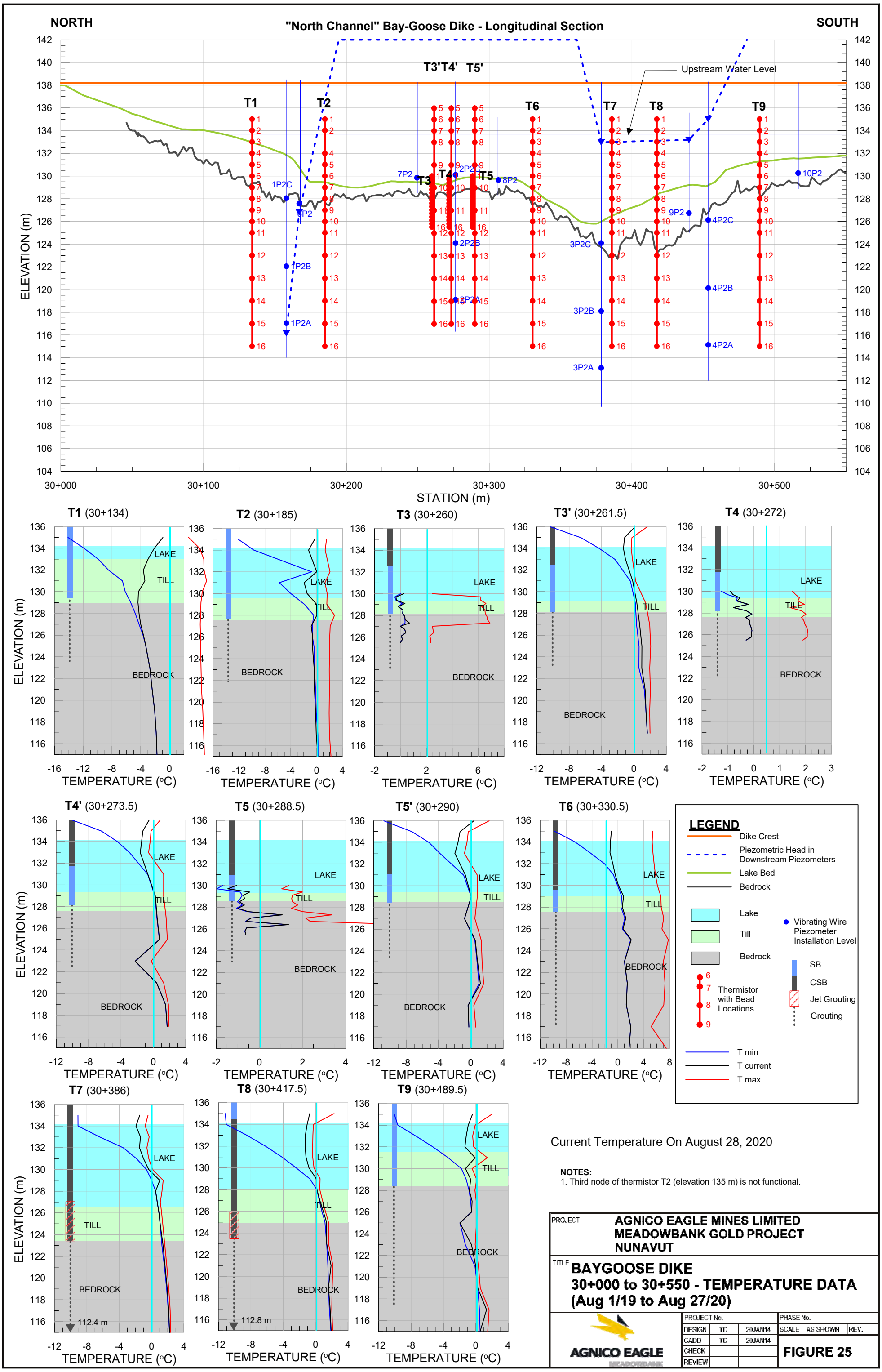


NOTES:
1. 29P1B2, 29P1B3, 29P2B3, 29P3B3 and 29P2C are given unstable readings and since the temperature shows a negative reading it is assumed to be frozen.

PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE - SECTION 32+105 PIEZOMETRIC DATA (July 1/11 to Aug 27/20)

AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	FIGURE 24	
REVIEW				



Current Temperature On August 28, 2020

NOTES:
1. Third node of thermistor T2 (elevation 135 m) is not functional.

PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE: BAYGOOSE DIKE
30+000 to 30+550 - TEMPERATURE DATA
(Aug 1/19 to Aug 27/20)

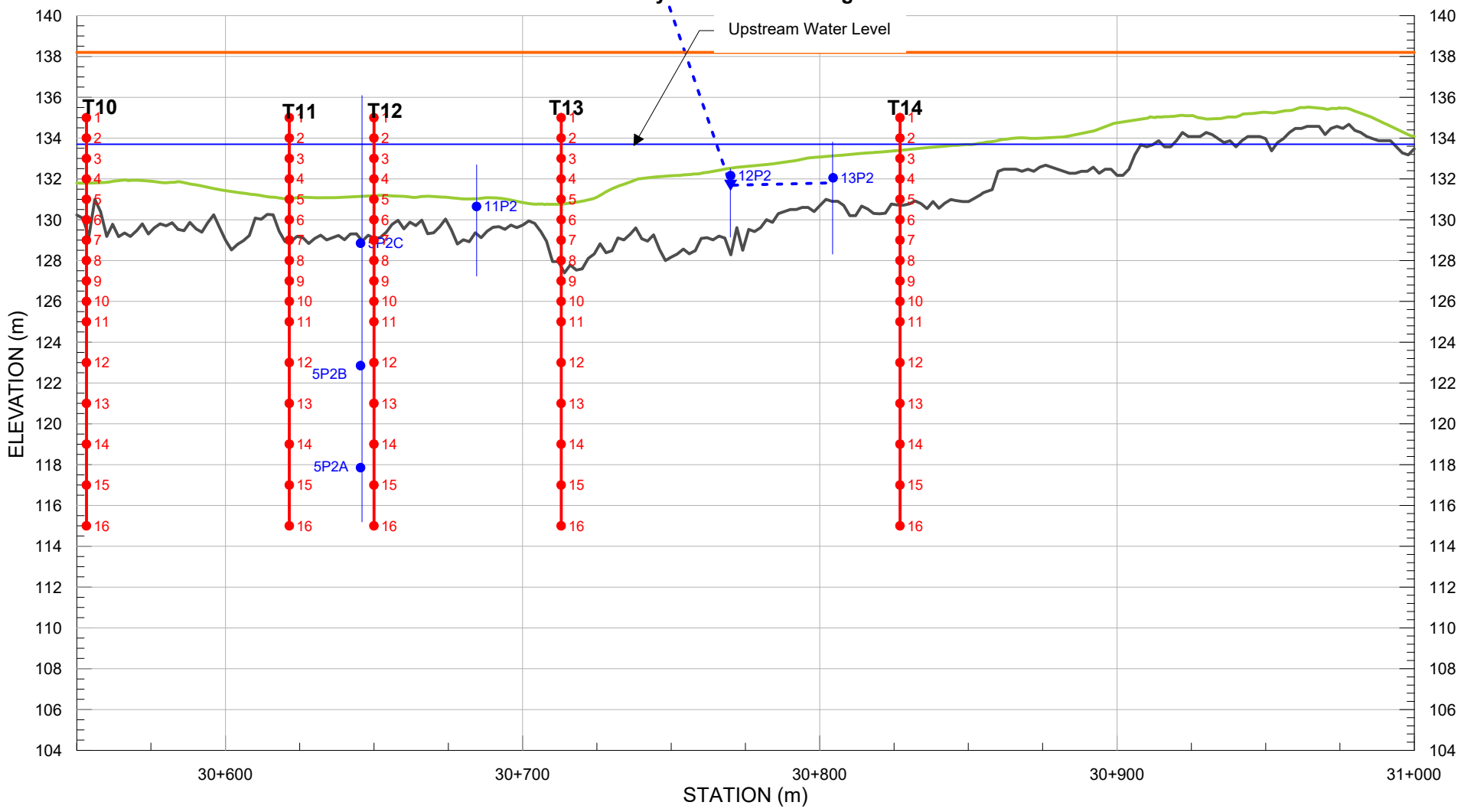
AGNICO EAGLE
MEADOWBANK

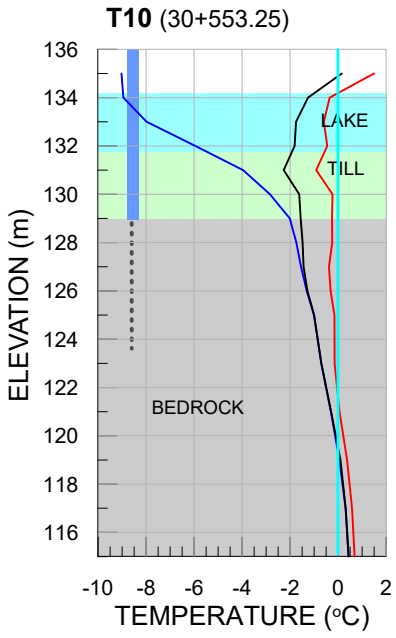
PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14		
CHECK			FIGURE 25	
REVIEW				

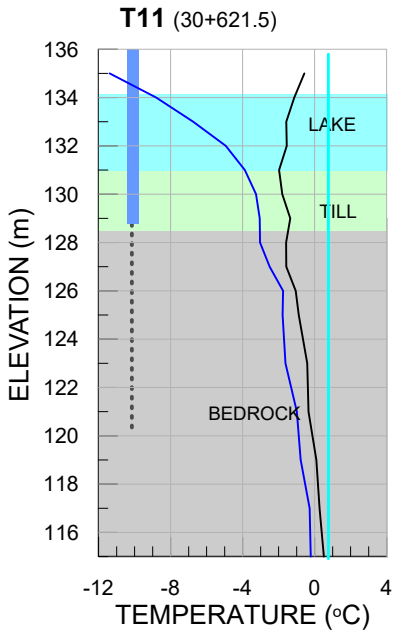
NORTH

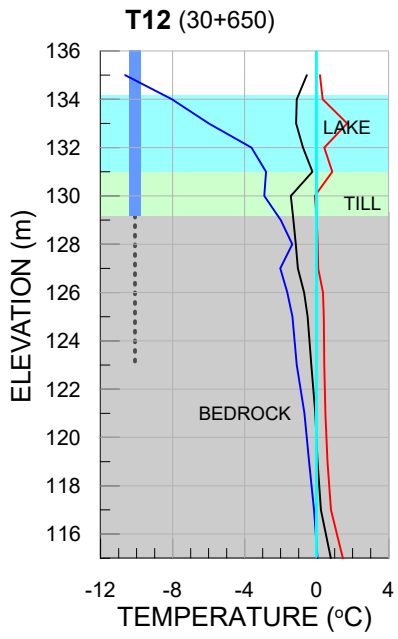
"North Shallows" Bay-Goose Dike - Longitudinal Section

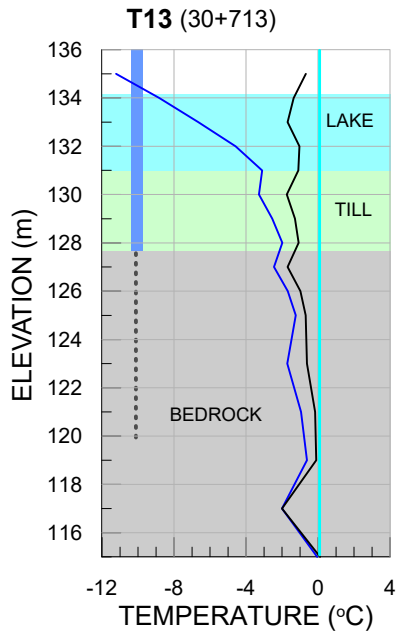
SOUTH

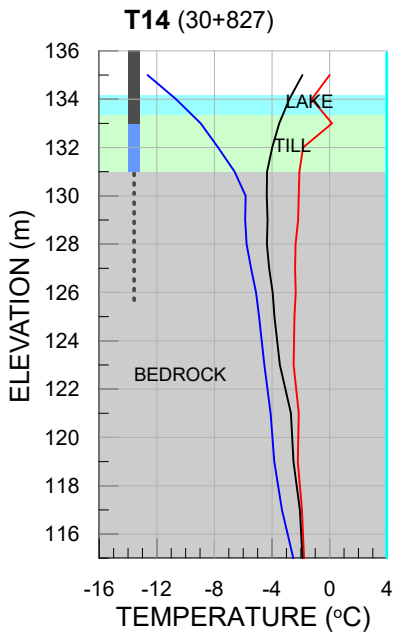












Current Temperature On August 28, 2020

LEGEND

- Dike Crest
- Piezometric Head in Downstream Piezometers
- Lake Bed
- Bedrock
- T min
- T current
- T max
- Lake
- Till
- Bedrock
- Thermistor with Bead Locations
- Vibrating Wire Piezometer Installation Level
- SB
- CSB
- Jet Grouting
- Grouting

PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE: BAYGOOSE DIKE
30+550 to 31+000 - TEMPERATURE DATA
(Aug 1/19 to Aug 27/20)

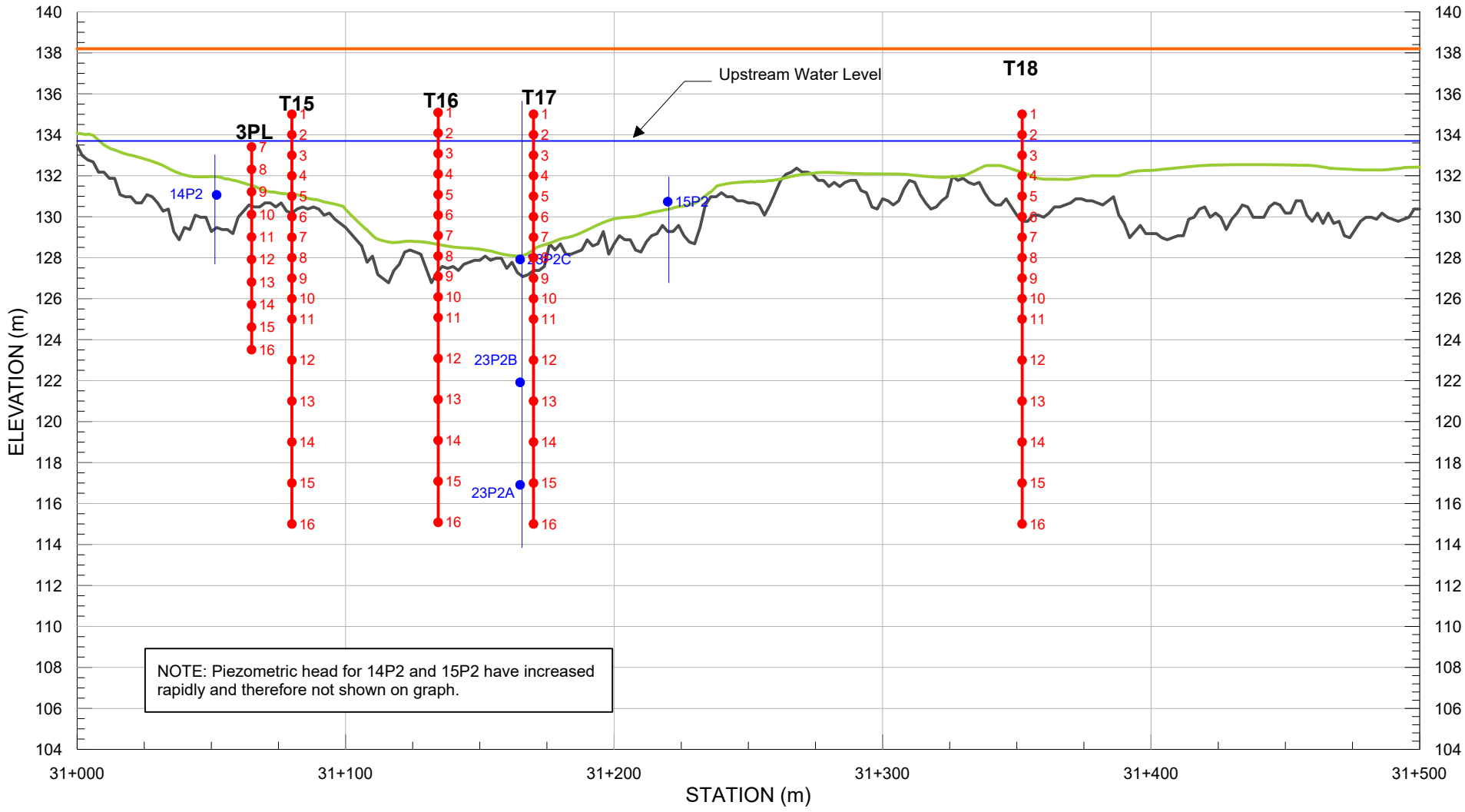
AGNICO EAGLE MEADOWBANK

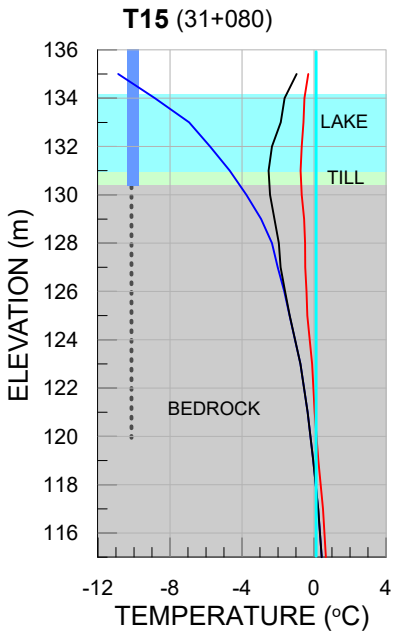
PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14		
CHECK			FIGURE 26	
REVIEW				

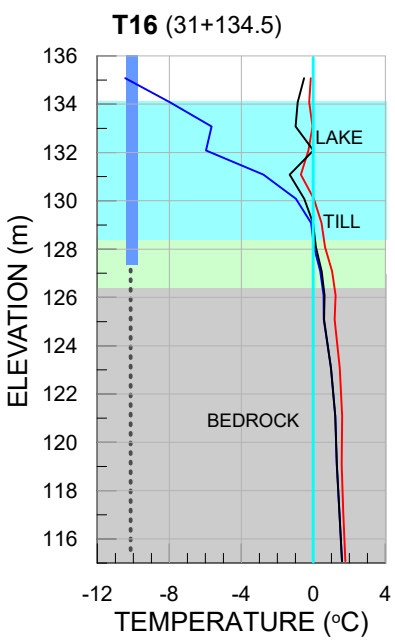
NORTH

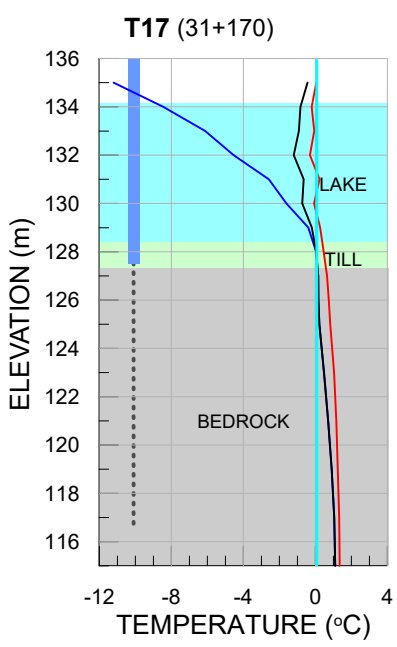
"South Channel & Shallows" Bay-Goose Dike - Longitudinal Section

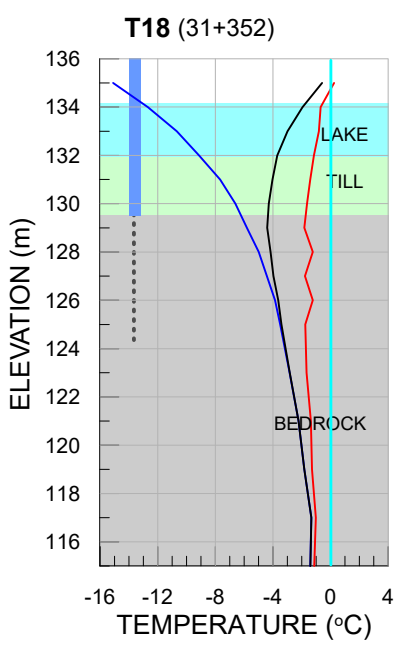
SOUTH



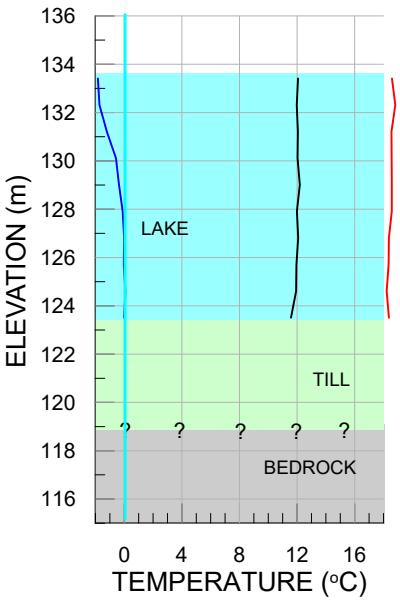








3PL - UPSTREAM LAKE
(31+065 Approx.)



Current Temperature On August 28, 2020

LEGEND

- Dike Crest
- Piezometric Head in Downstream Piezometers
- Lake Bed
- Bedrock
- T min
- T current
- T max
- Lake
- Till
- Bedrock
- Thermistor with Bead Locations
- Vibrating Wire Piezometer Installation Level
- SB
- CSB
- Jet Grouting
- Grouting

NOTES:
1. Thermistor 3PL is installed upstream of the dike within Third Portage Lake.

PROJECT: **AGNICO EAGLE MINES LIMITED**
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE: **BAYGOOSE DIKE**
31+000 to 31+500 - TEMPERATURE DATA
(Aug 1/19 to Aug 27/20)

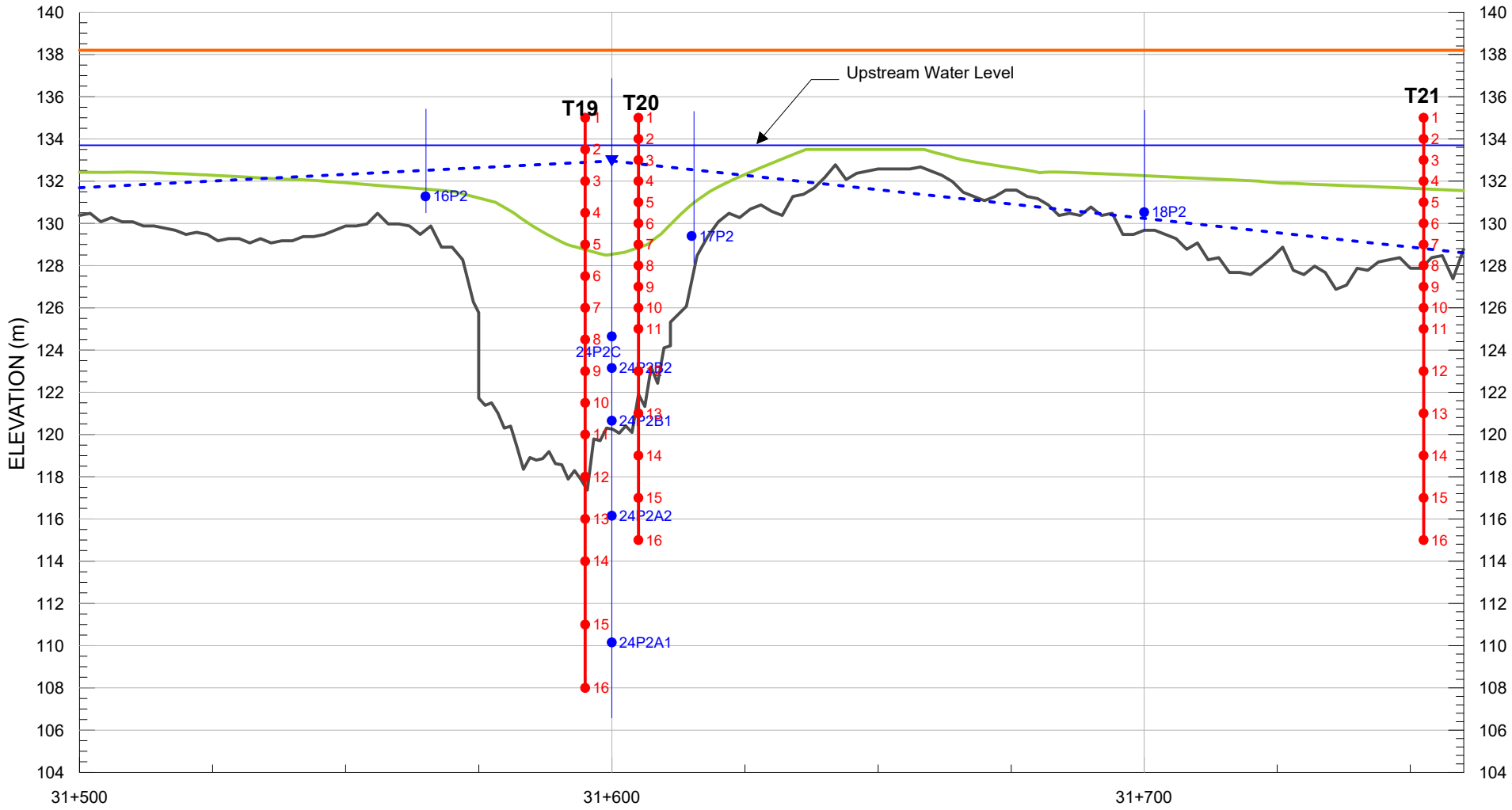
AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14		
CHECK			**FIGURE 27**	
REVIEW				

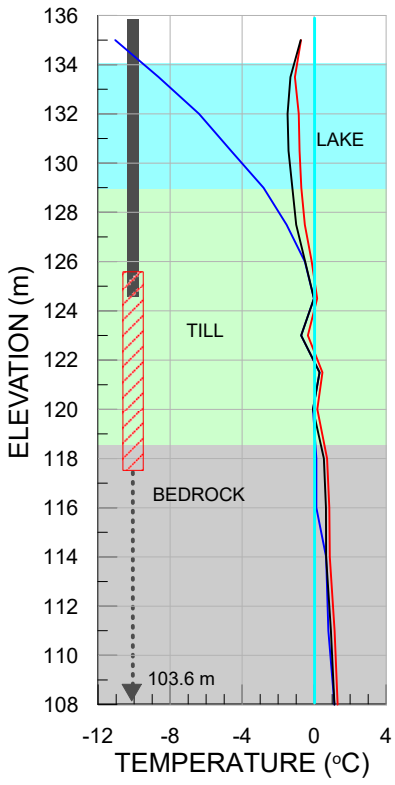
EAST

"Channel 3 - South Shallows" Bay-Goose Dike - Longitudinal Section

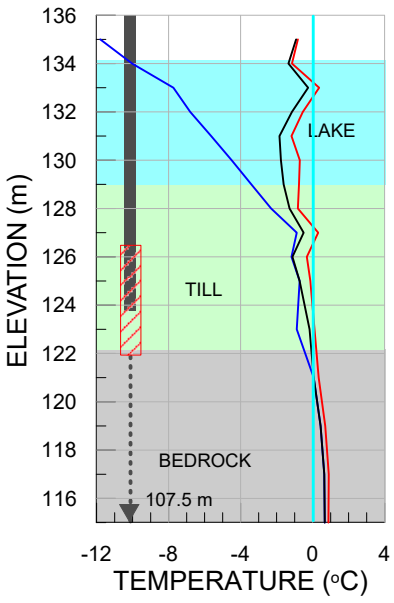
WEST



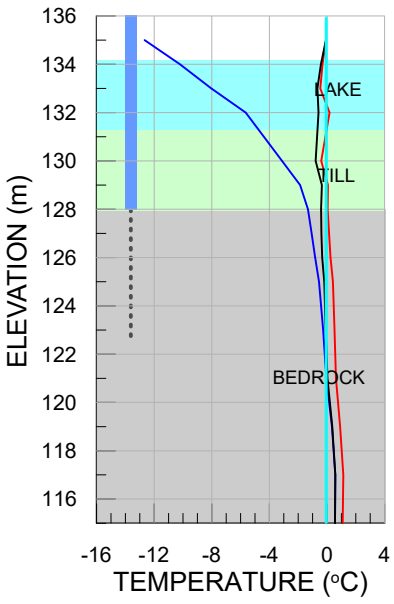
T19 (31+595)



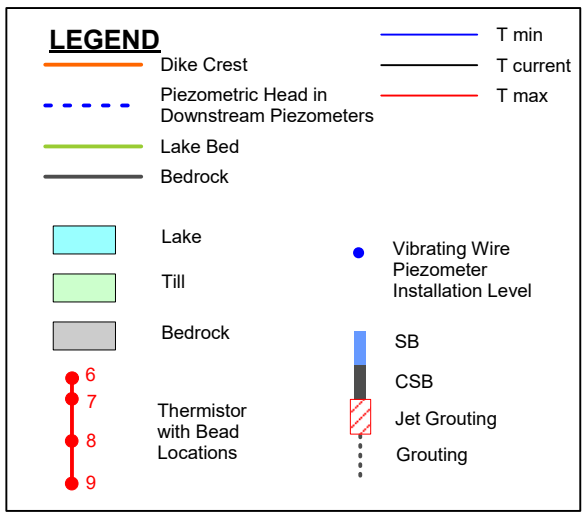
T20 (31+605)



T21 (31+752.5)



Current Temperature On August 28, 2020



PROJECT: AGNICOEAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE: BAYGOOSE DIKE
31+500 to 31+760 - TEMPERATURE DATA
(Aug 1/19 to Aug 27/20)

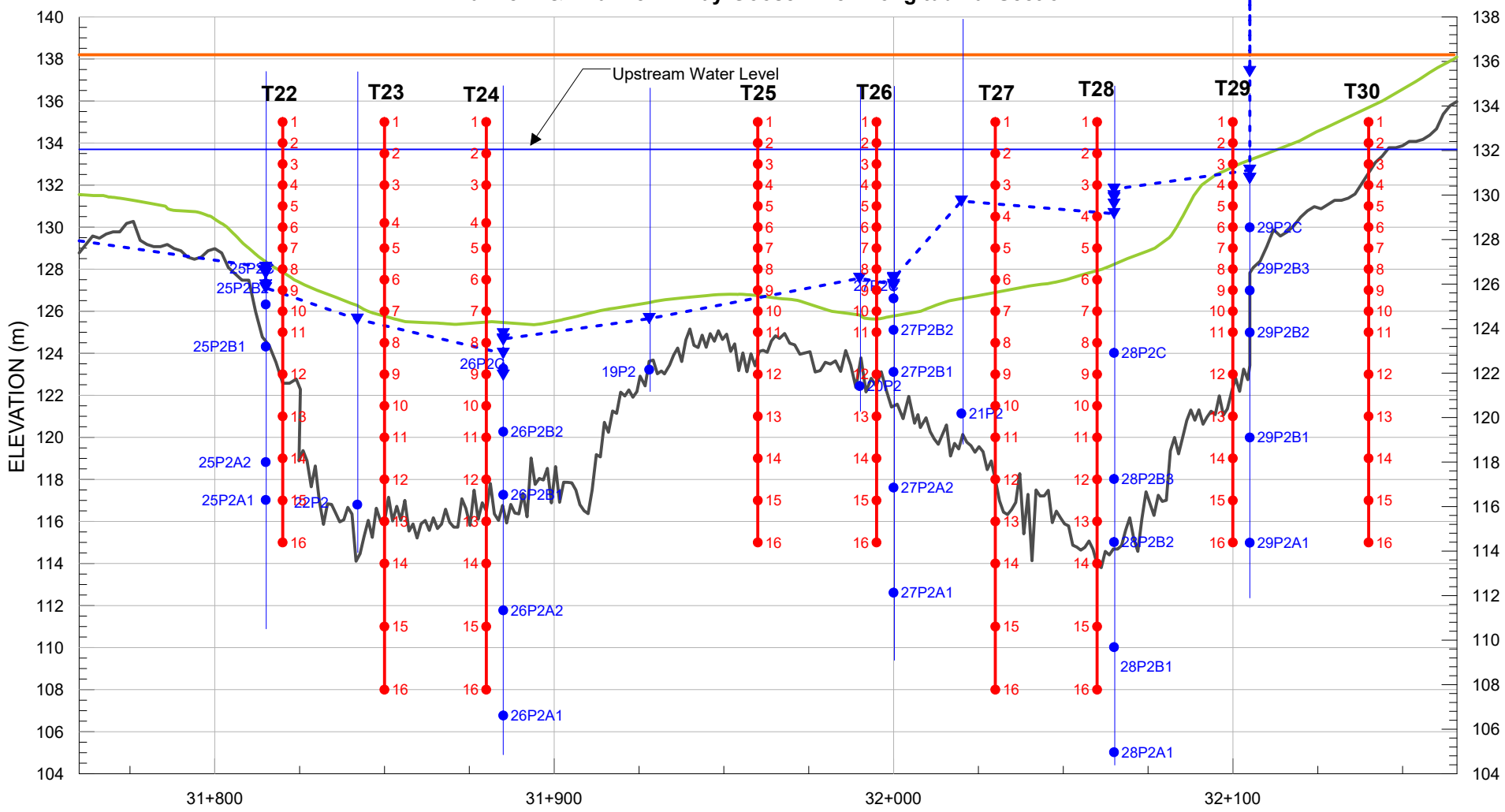
AGNICO EAGLE
MEADOWBANK

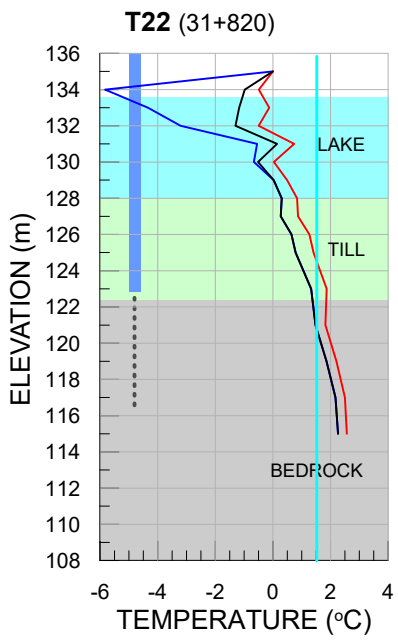
PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14		
CHECK			FIGURE 28	
REVIEW				

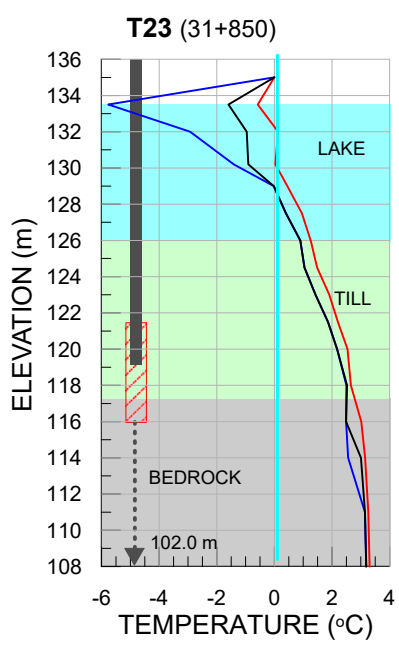
SOUTHEAST

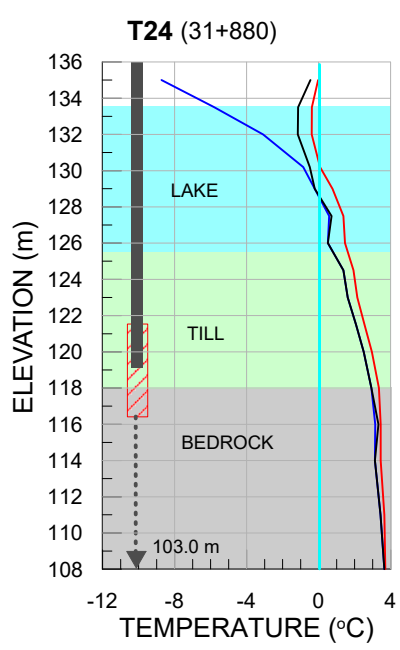
"Channel 2 & Channel 1" Bay-Goose Dike - Longitudinal Section

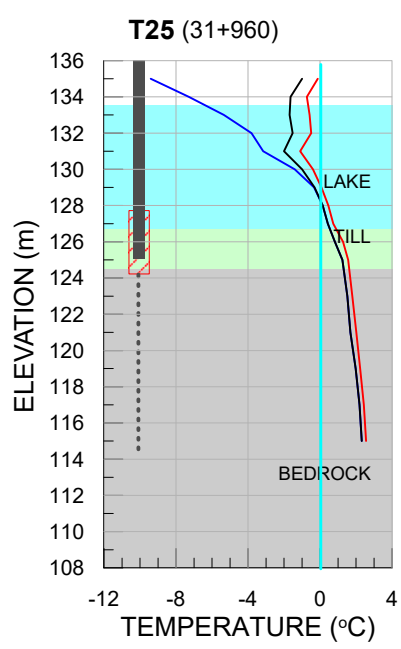
NORTHWEST

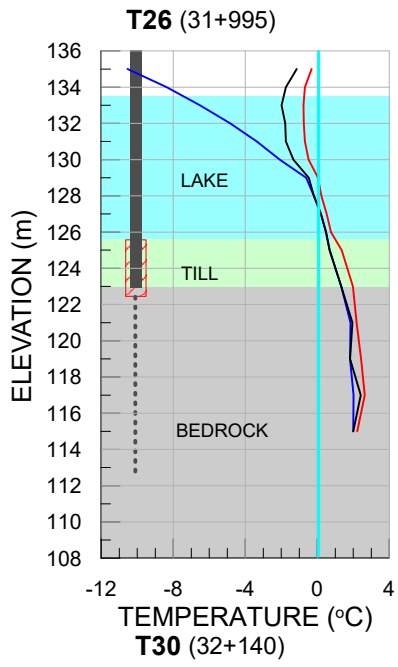


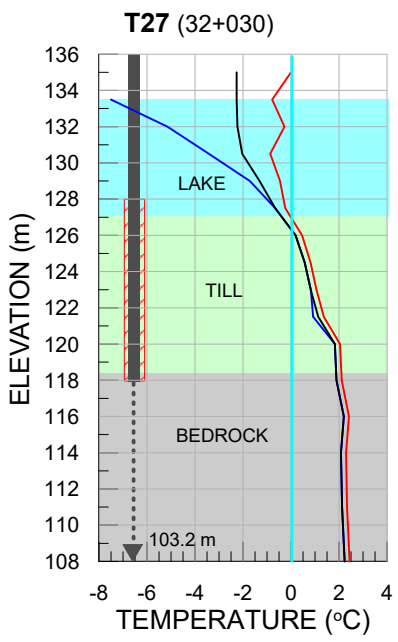


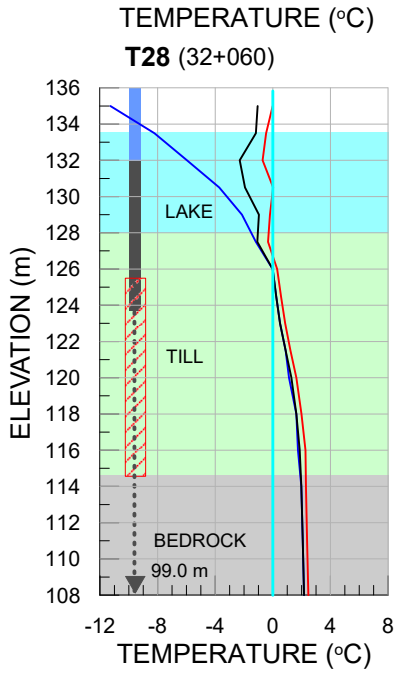


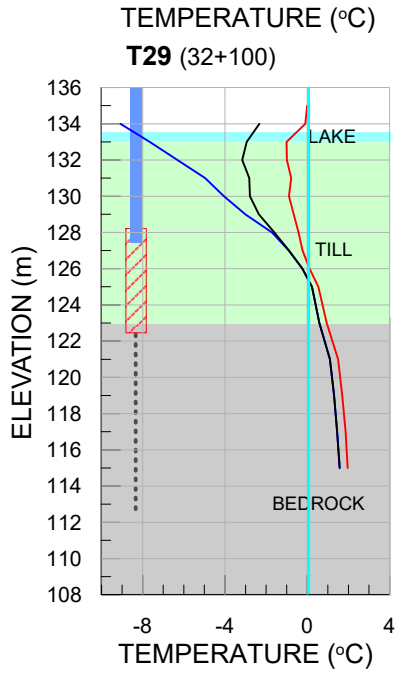


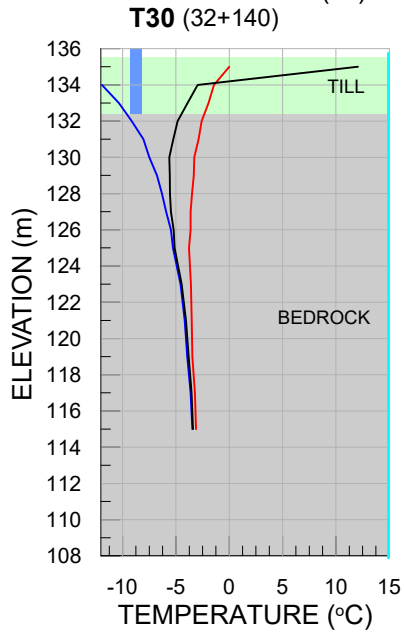


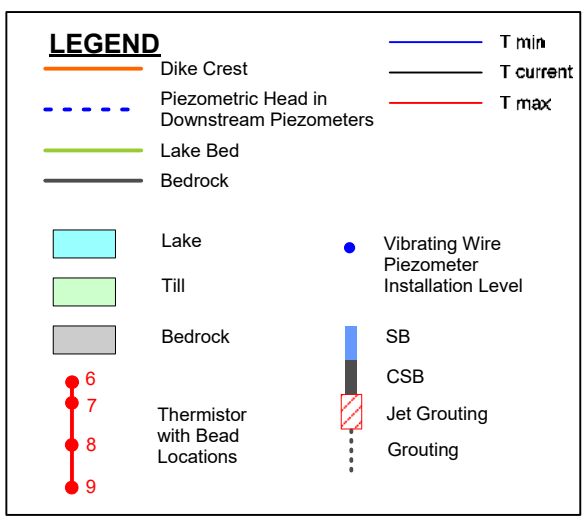












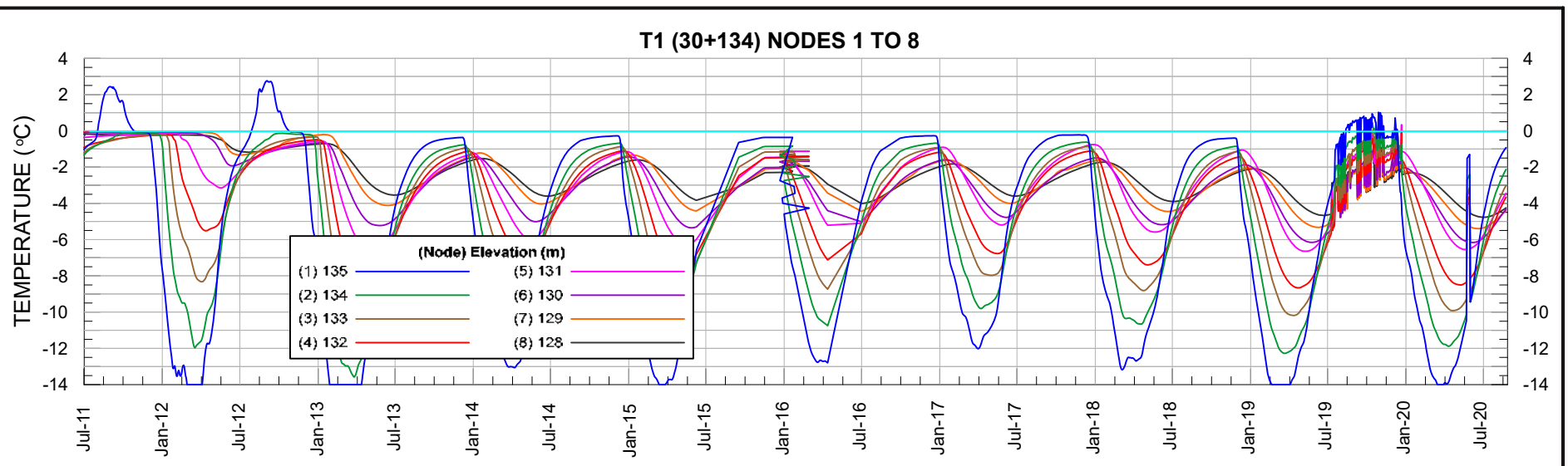
Current Temperature On August 28, 2020

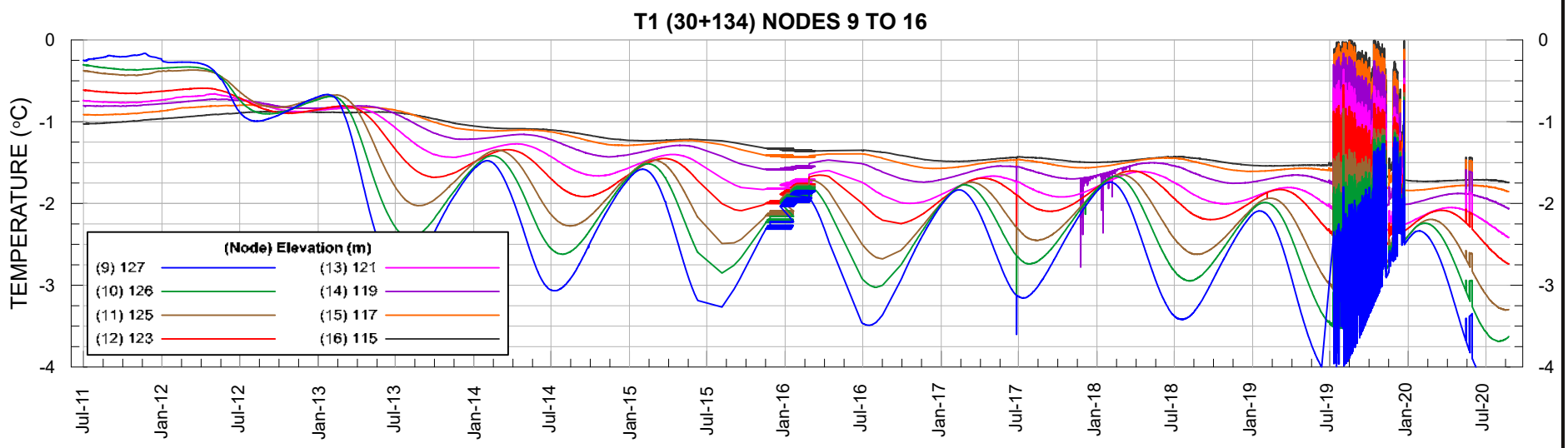
PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

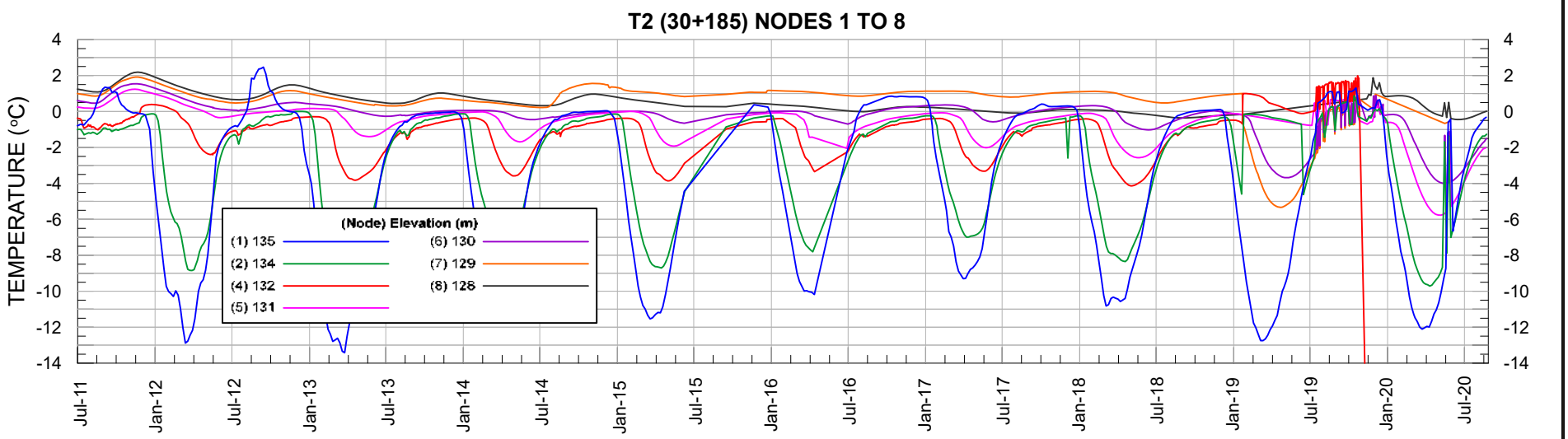
TITLE: BAYGOOSE DIKE
31+760 to 32+166 - TEMPERATURE DATA
(Aug 1/19 to Aug 27/20)

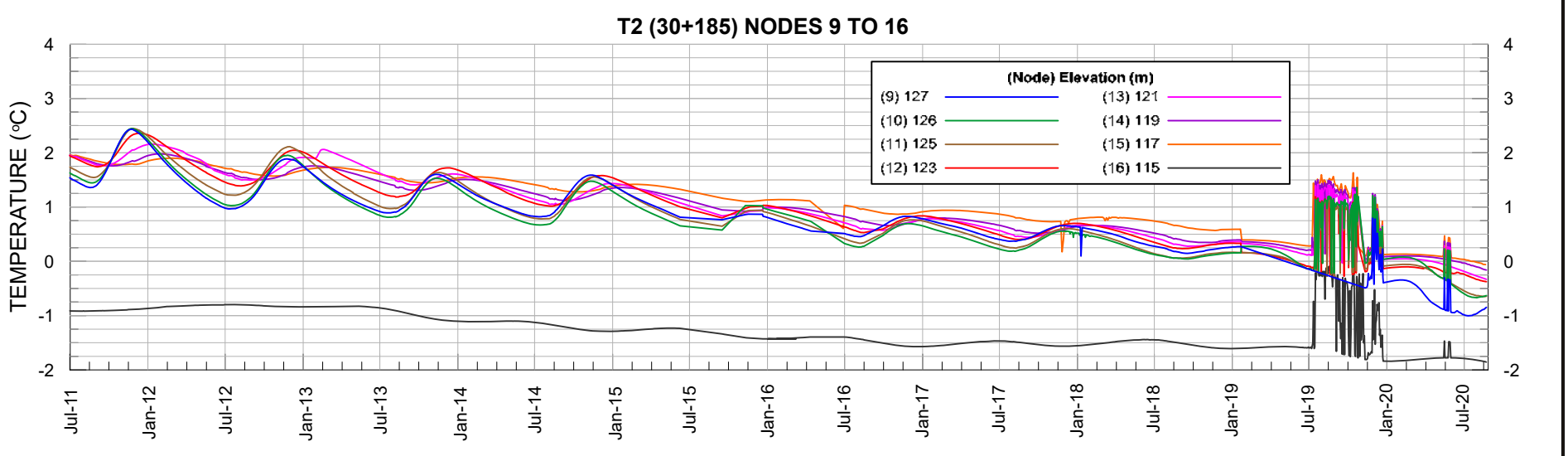
AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14		
CHECK			FIGURE 29	
REVIEW				









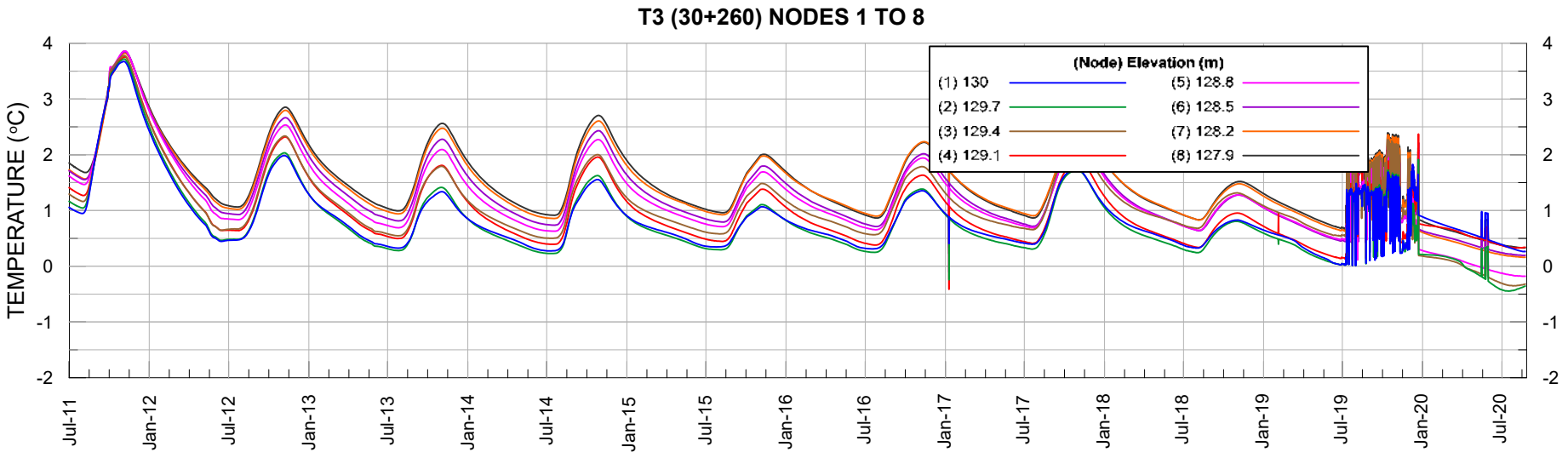
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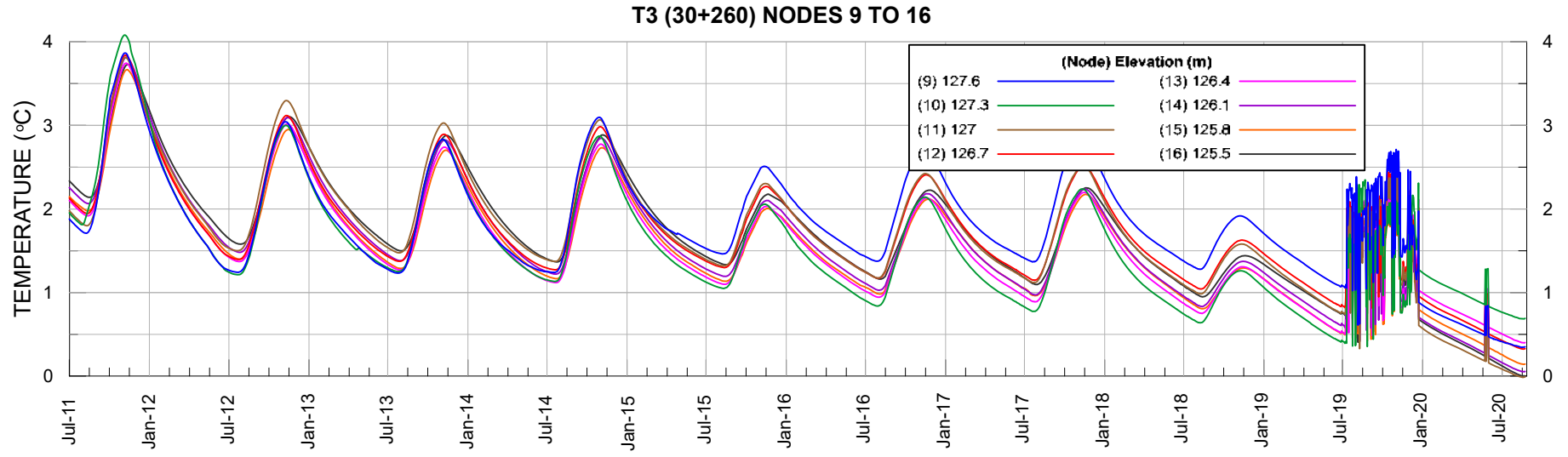
PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

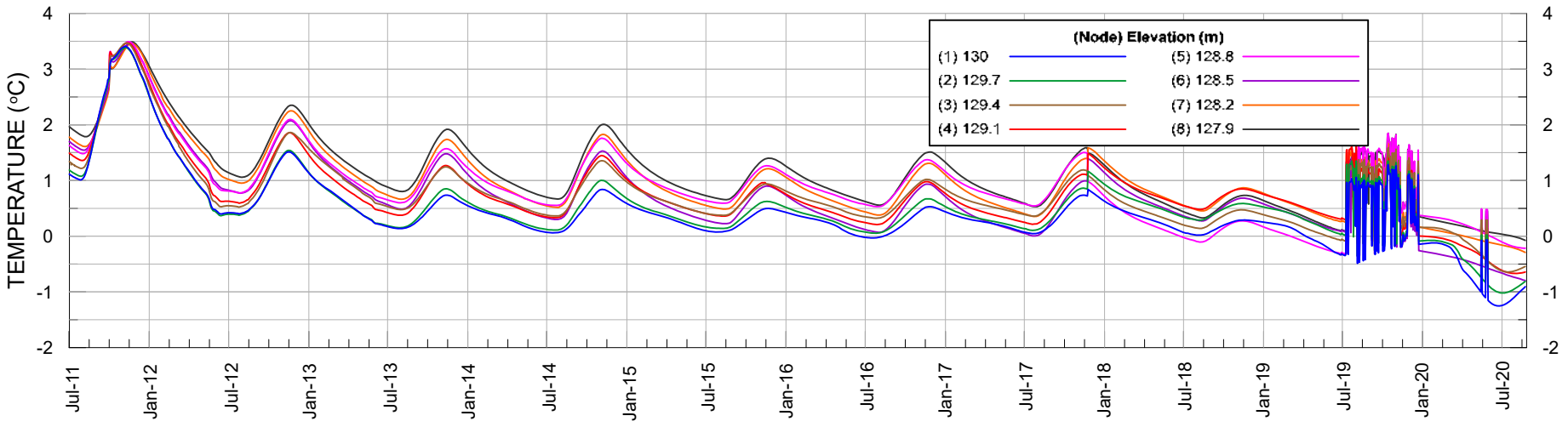
TITLE: BAYGOOSE DIKE
NODAL THERMAL TIMELINES
(July 1/11 to Aug 27/20)

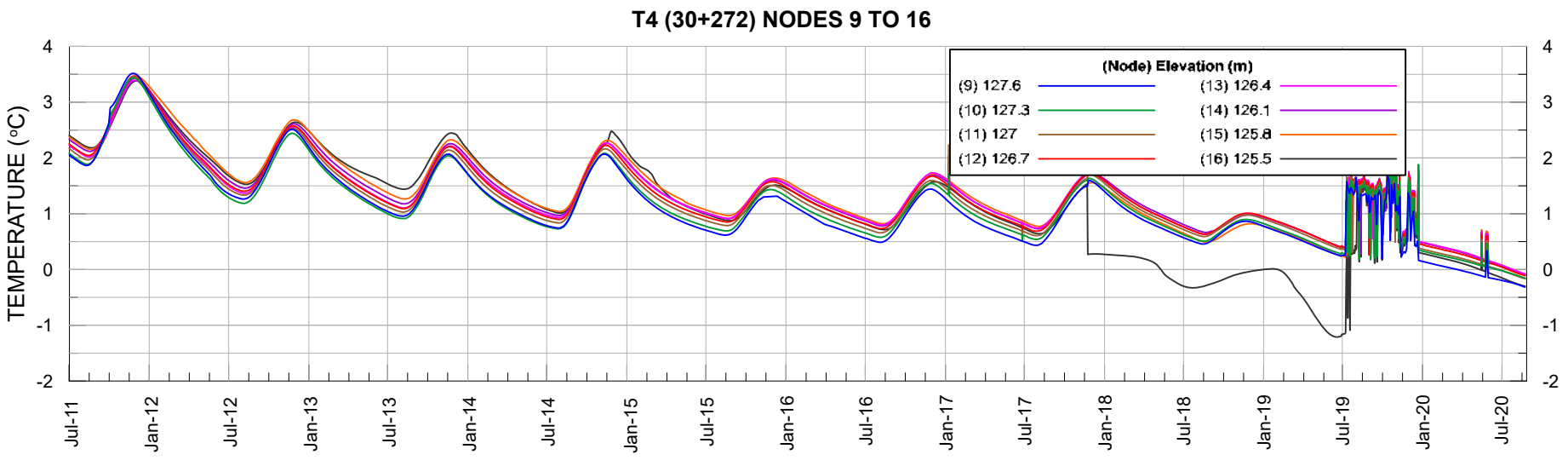
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.
DESIGN	TD	20JAN14	SCALE AS SHOWN REV.
CADD	TD	20JAN14	FIGURE 30
CHECK			
REVIEW			









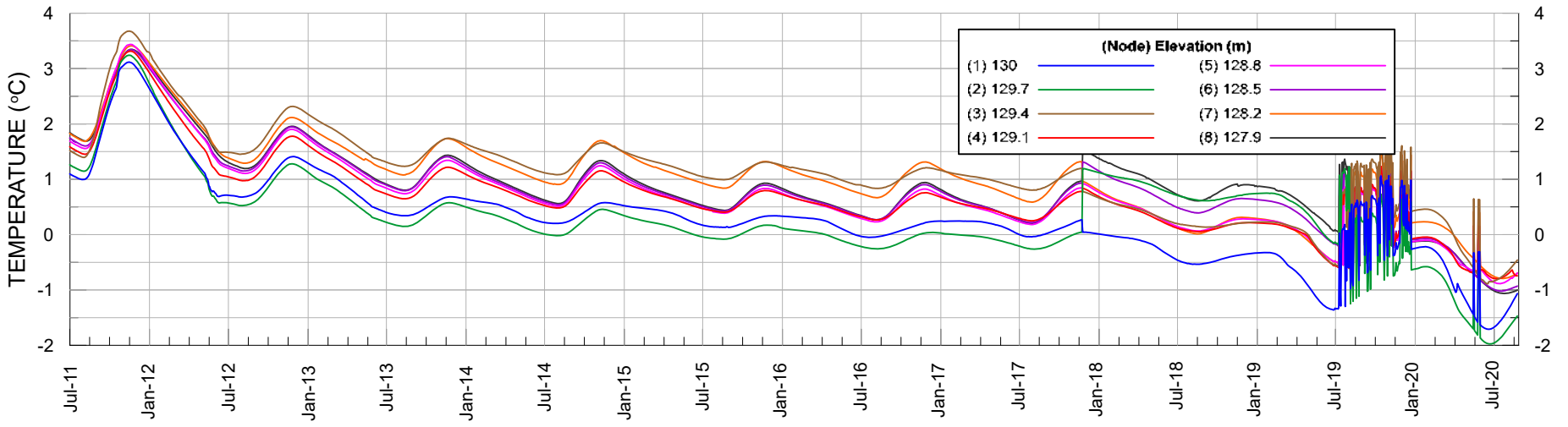
NOTE:

PROJECT	**AGNICO EAGLE MINES LIMITED** **MEADOWBANK GOLD PROJECT** **NUNAVUT**
TITLE	**BAYGOOSE DIKE** **NODAL THERMAL TIMELINES** **(July 1/11 to Aug 27/20)**

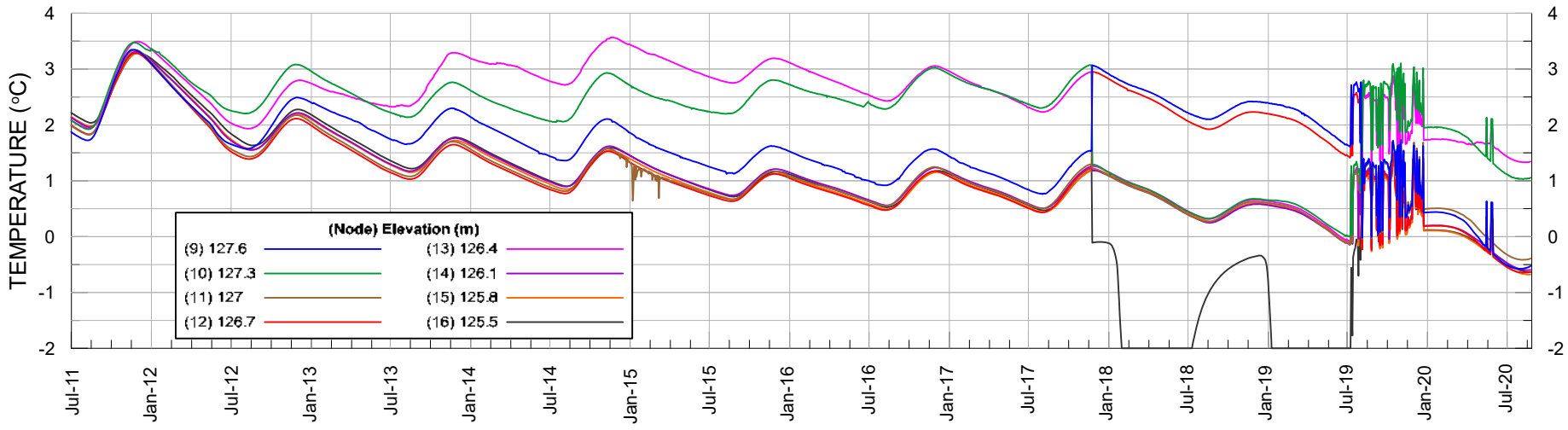
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14		
CHECK			**FIGURE 31**	
REVIEW				

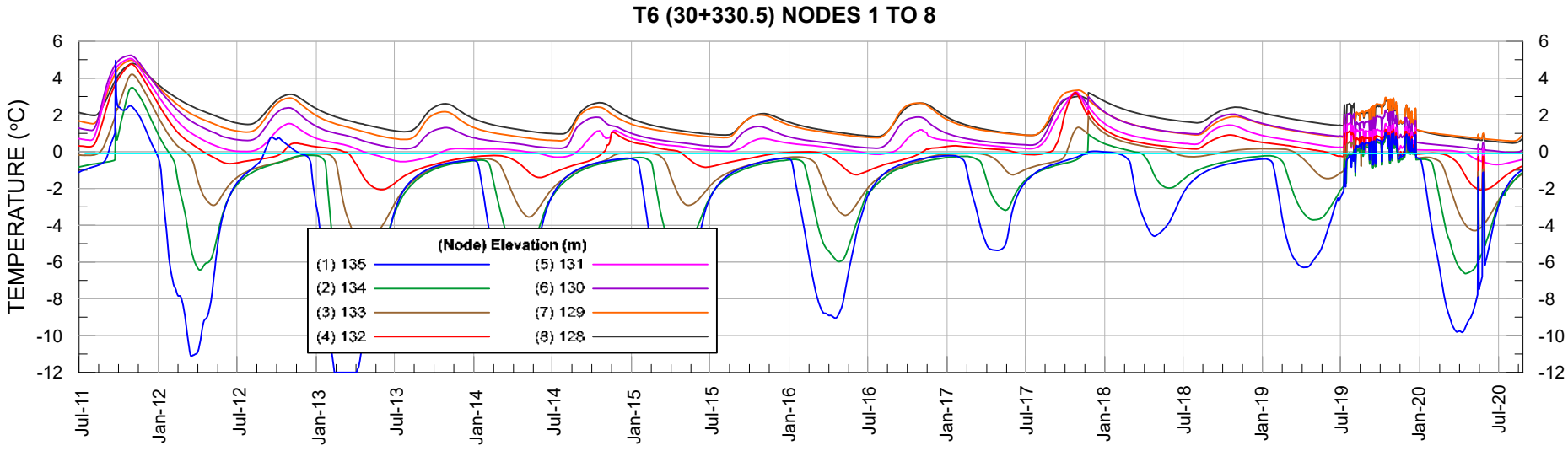
T5 (30+288.5) NODES 1 TO 8



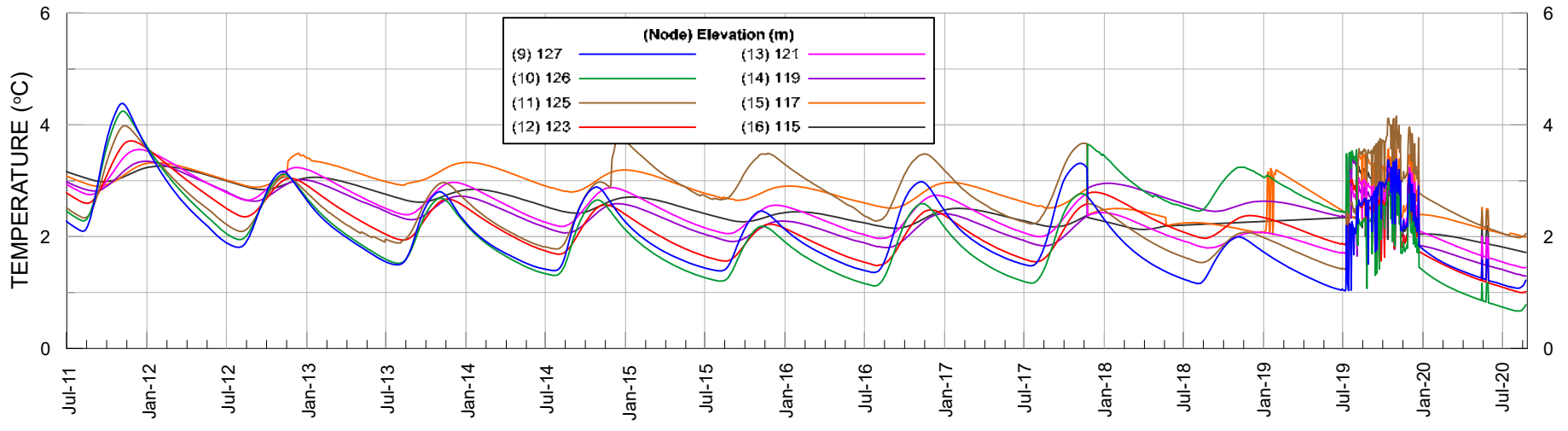
T5 (30+288.5) NODES 9 TO 16



T6 (30+330.5) NODES 1 TO 8



T6 (30+330.5) NODES 9 TO 16

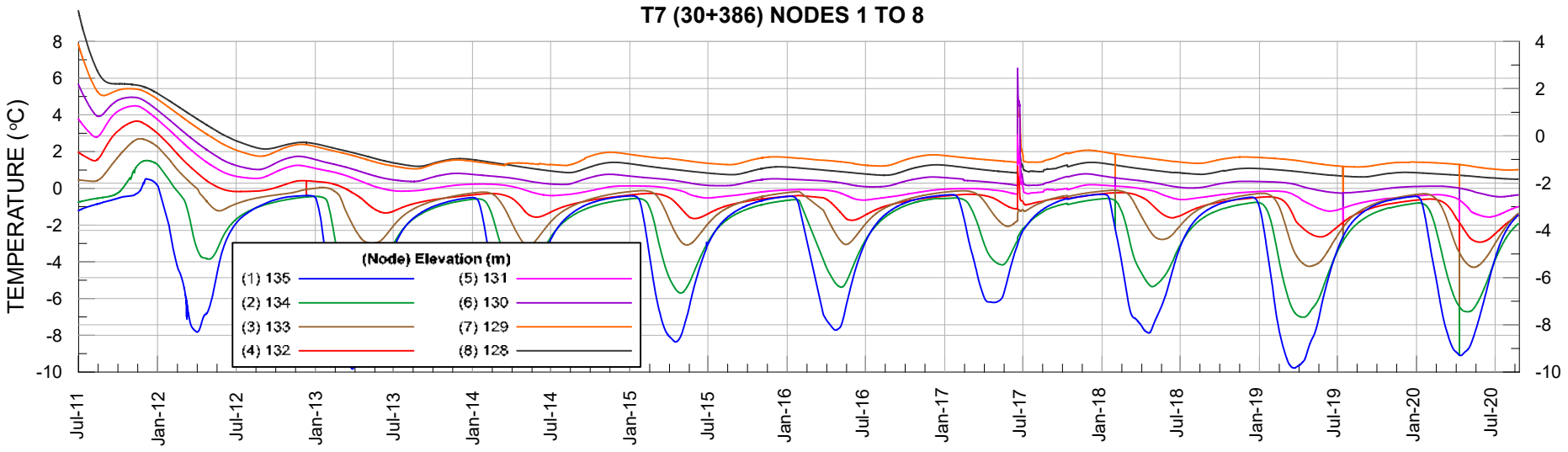


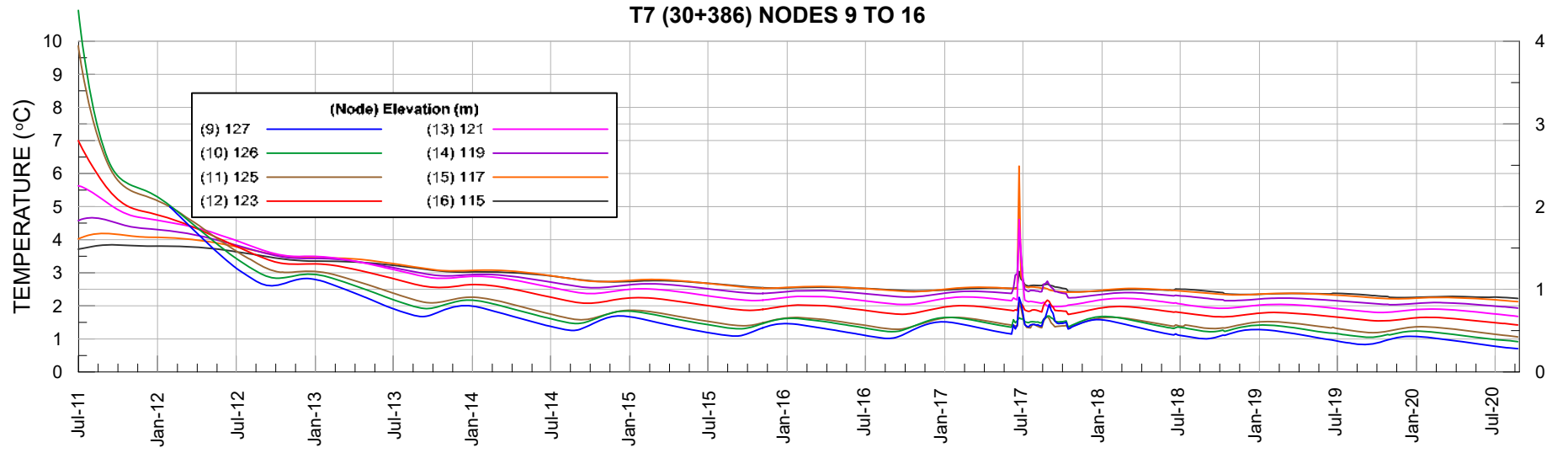
NOTE:

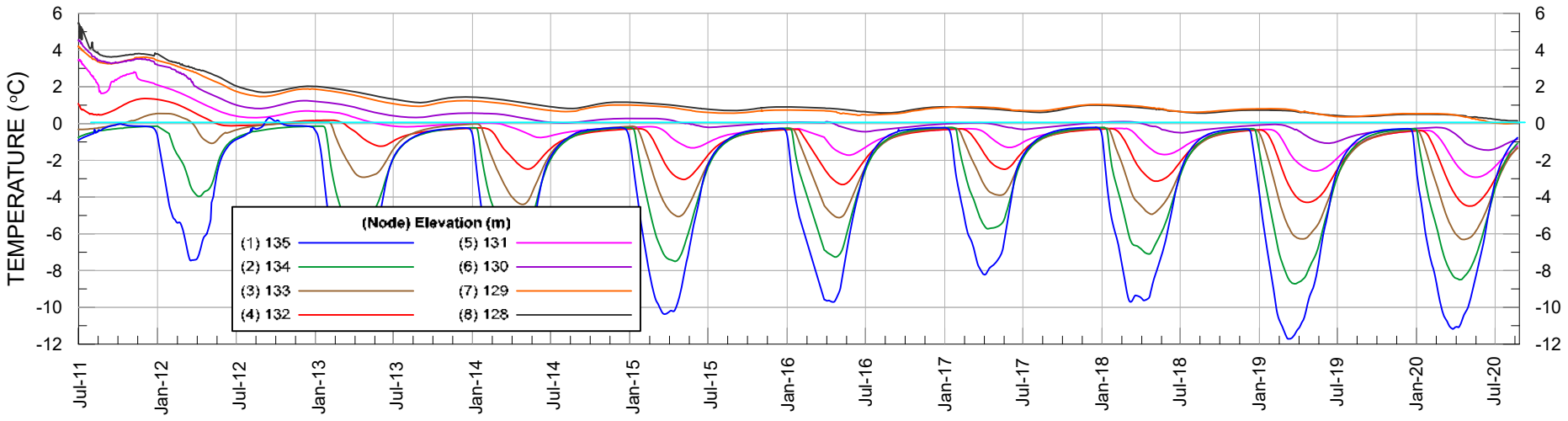
PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE NODAL THERMAL TIMELINES (July 1/11 to Aug 27/20)

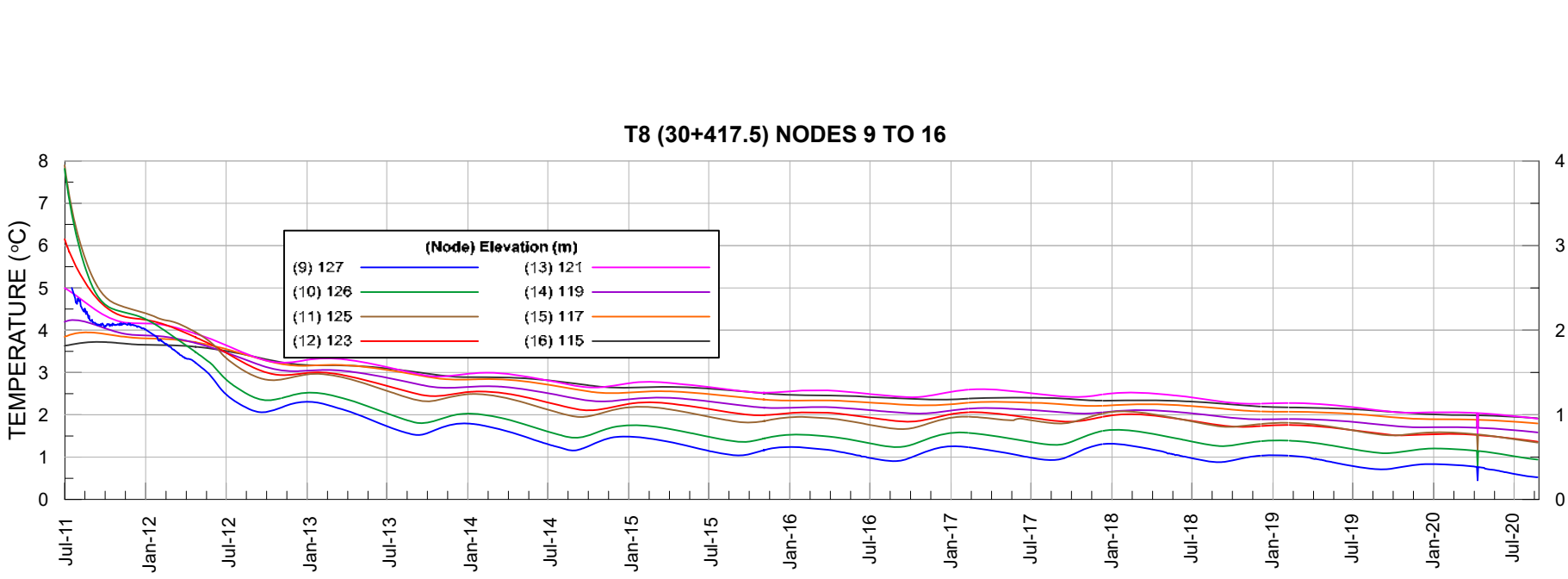
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14	FIGURE 32	
CHECK				
REVIEW				









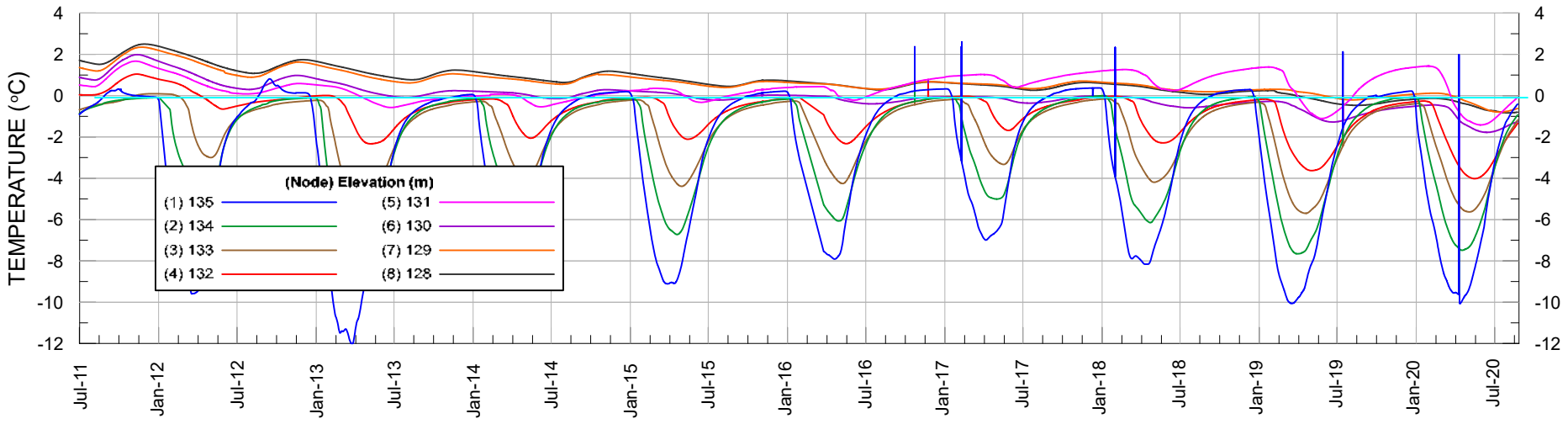
NOTE:

PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE NODAL THERMAL TIMELINES (July 1/11 to Aug 27/20)

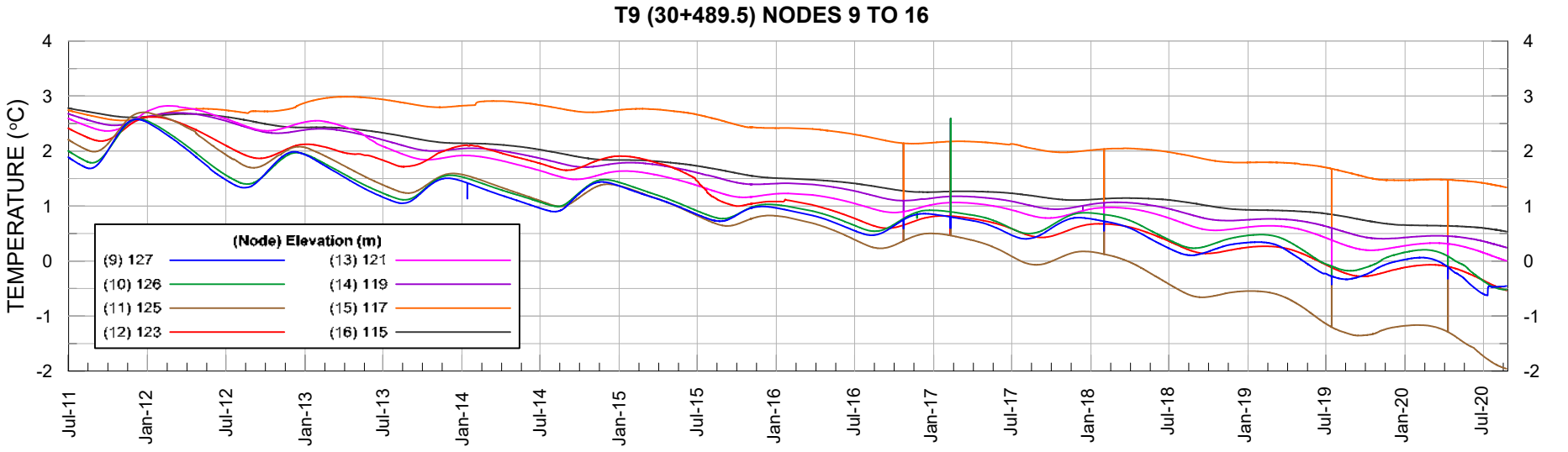
AGNICO EAGLE

PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14	FIGURE 33	
CHECK				
REVIEW				

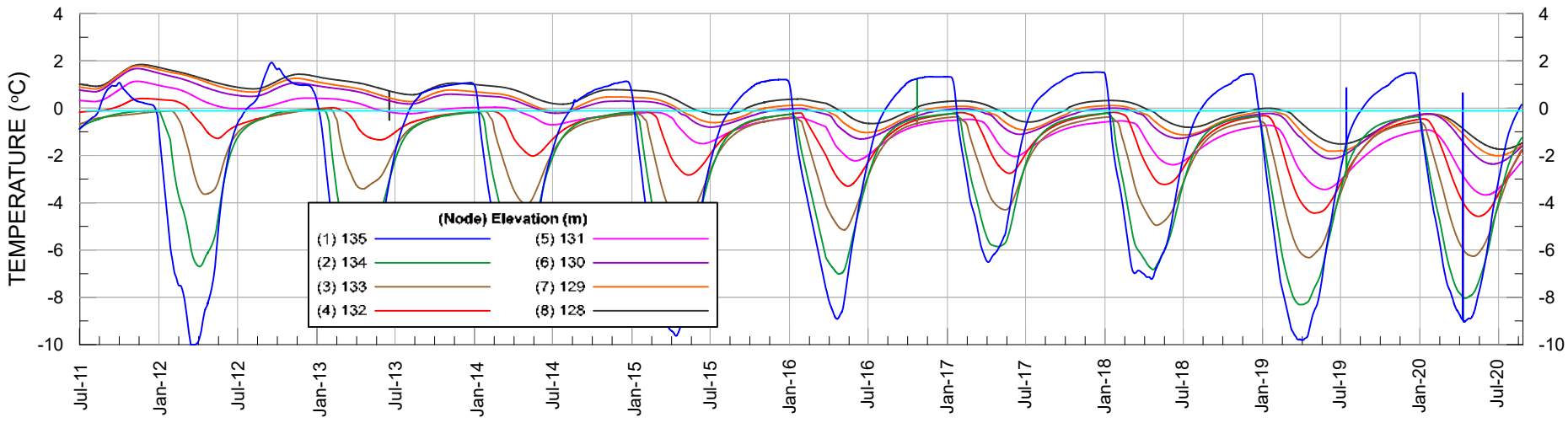
T9 (30+489.5) NODES 1 TO 8



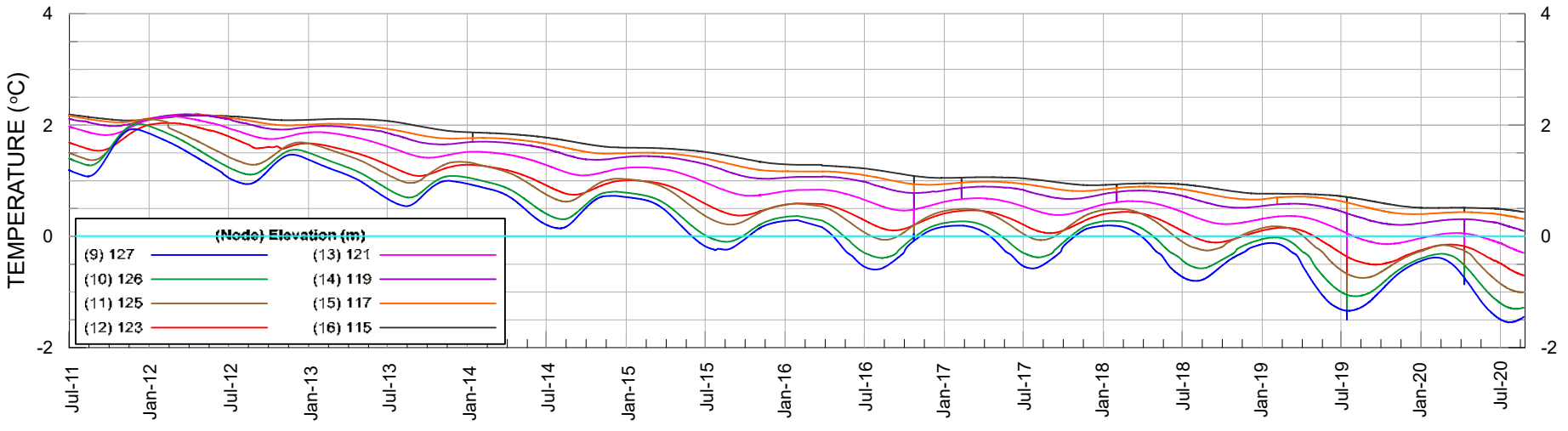
T9 (30+489.5) NODES 9 TO 16



T10 (30+553.25) NODES 1 TO 8



T10 (30+553.25) NODES 9 TO 16

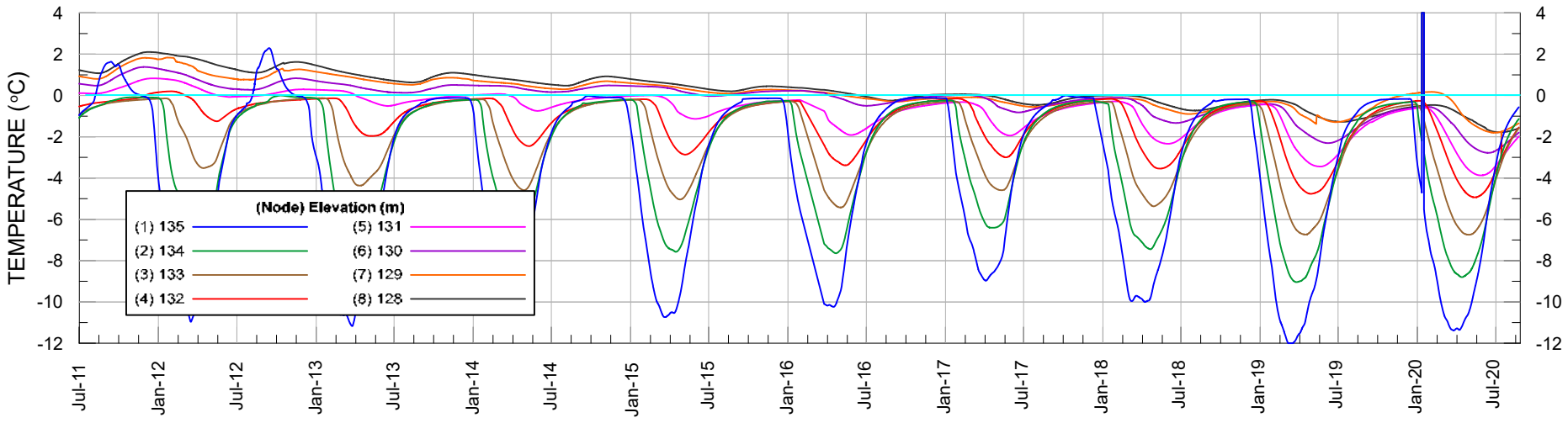


PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE NODAL THERMAL TIMELINES (July 1/11 to Aug 27/20)

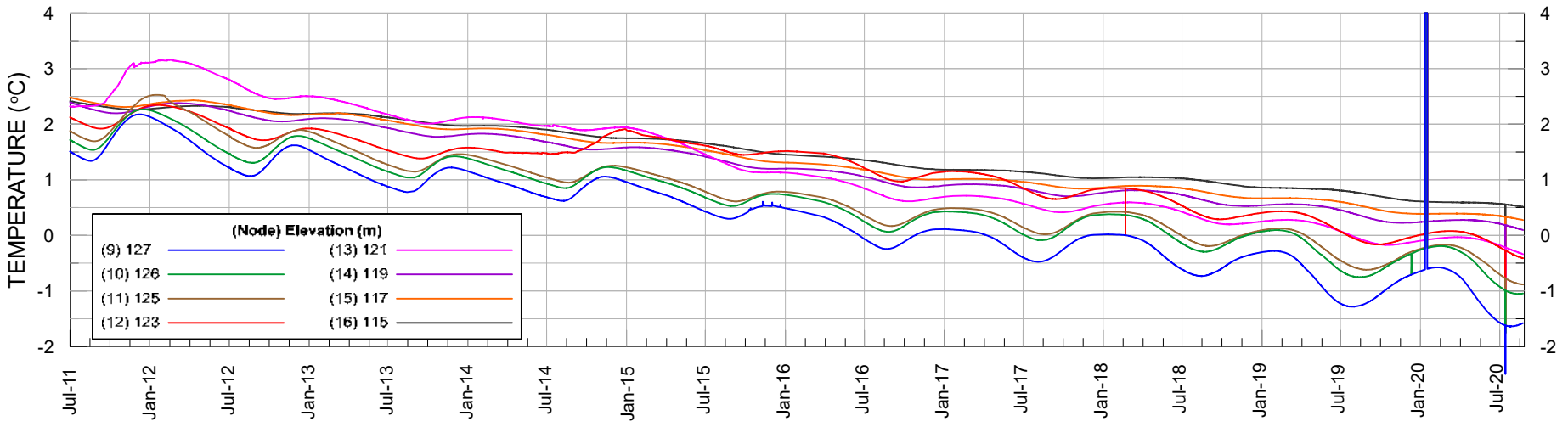
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14	FIGURE 34	
CHECK				
REVIEW				

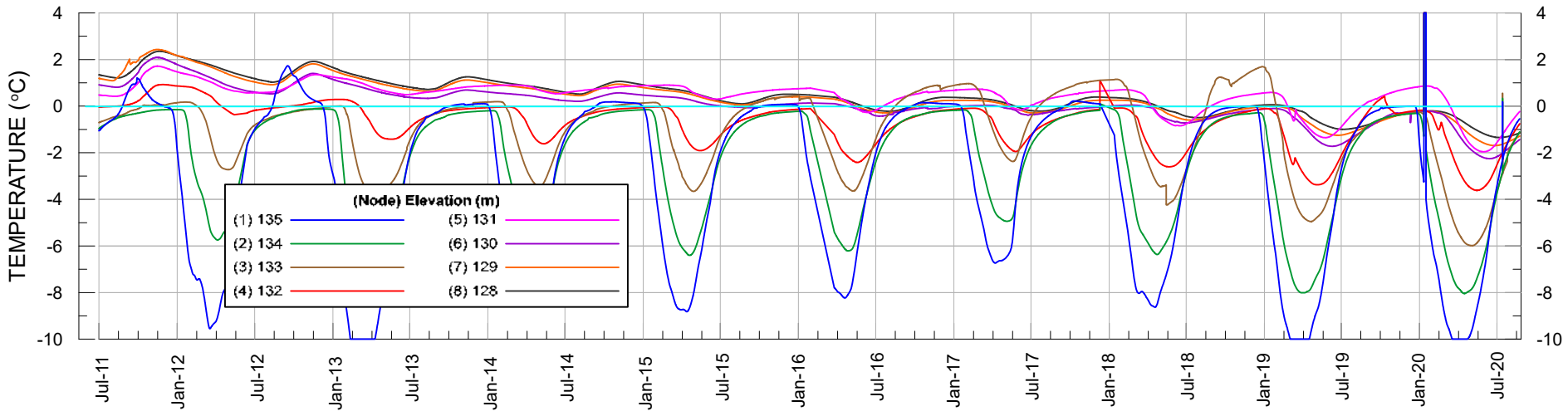
T11 (30+621.5) NODES 1 TO 8



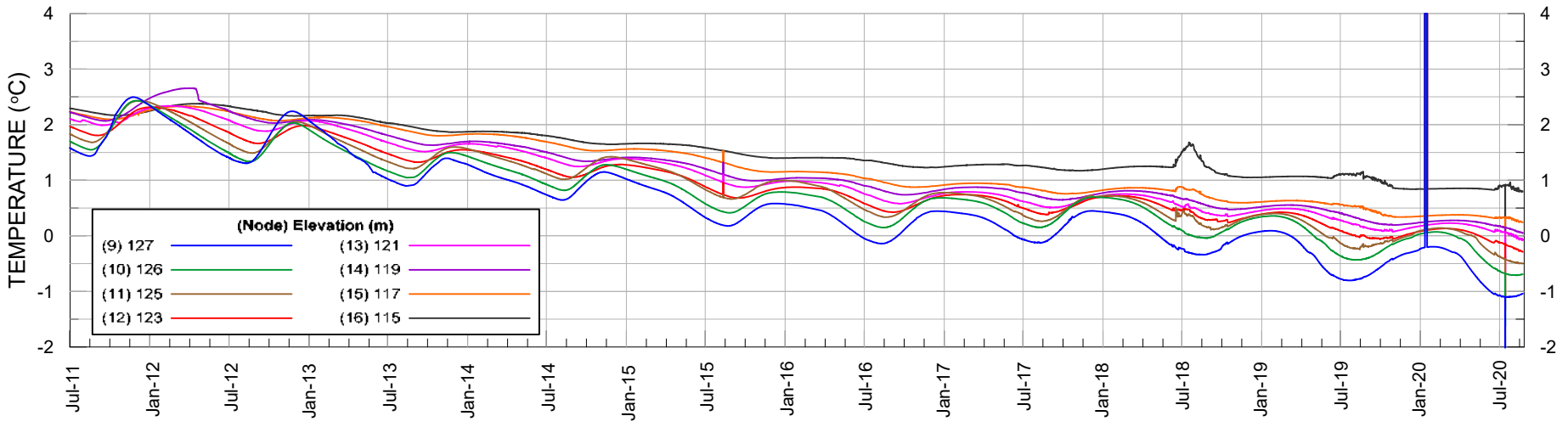
T11 (30+621.5) NODES 9 TO 16



T12 (30+650) NODES 1 TO 8



T12 (30+650) NODES 9 TO 16

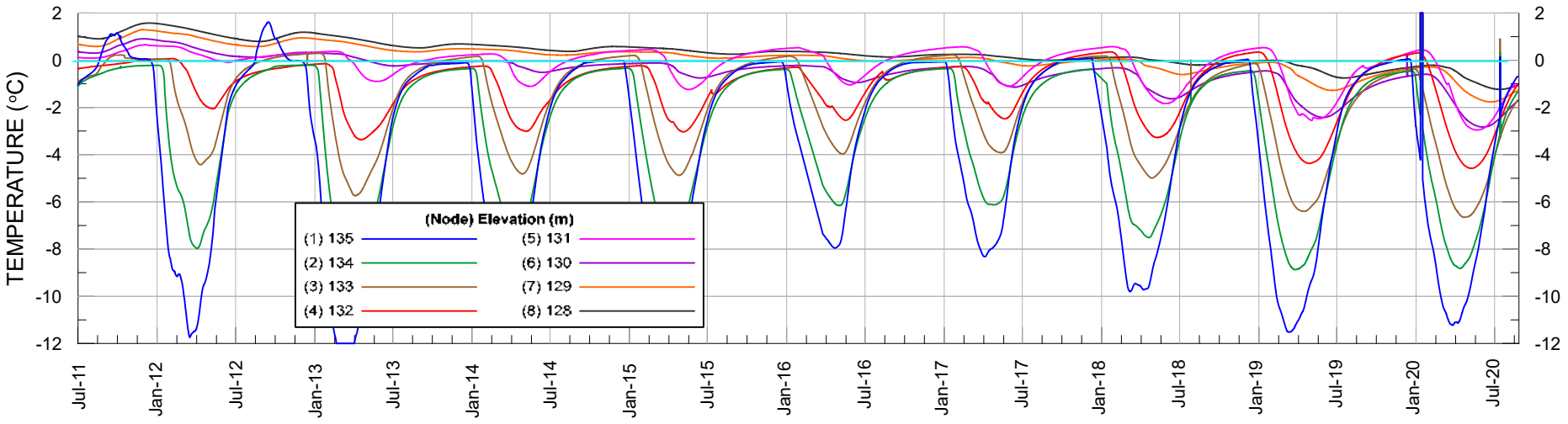


PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE NODAL THERMAL TIMELINES (July 1/11 to Aug 27/20)

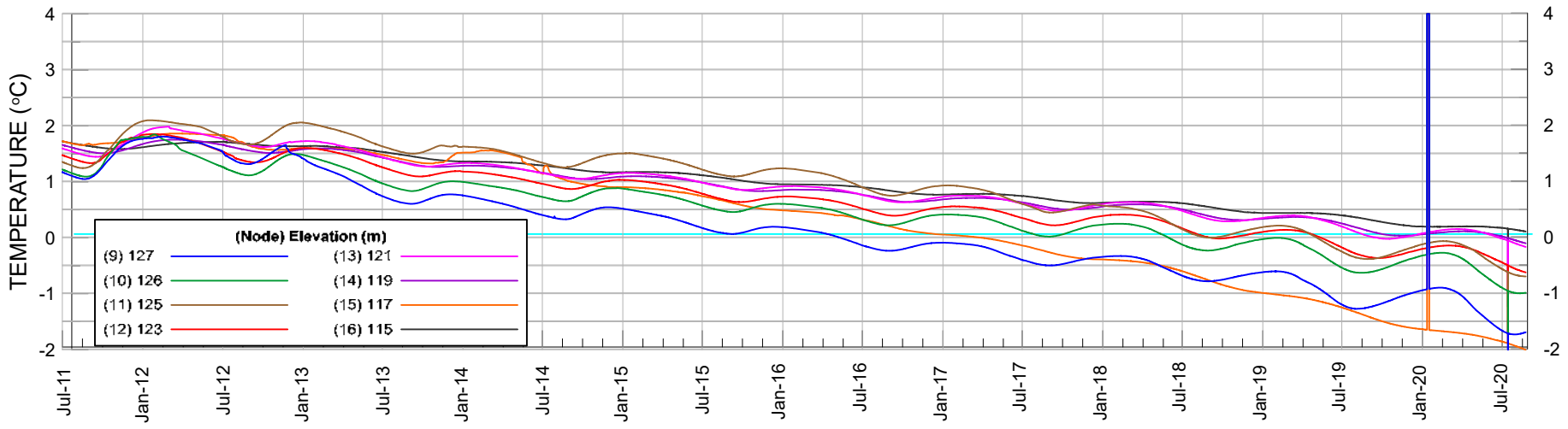
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14		
CHECK			FIGURE 35	
REVIEW				

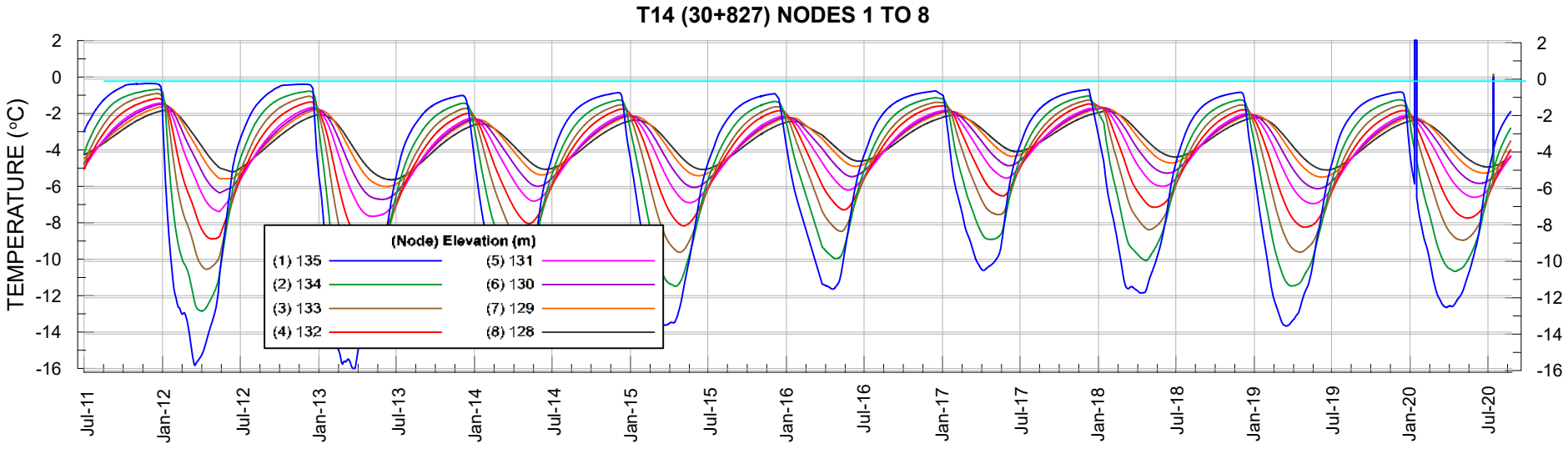
T13 (30+713) NODES 1 TO 8



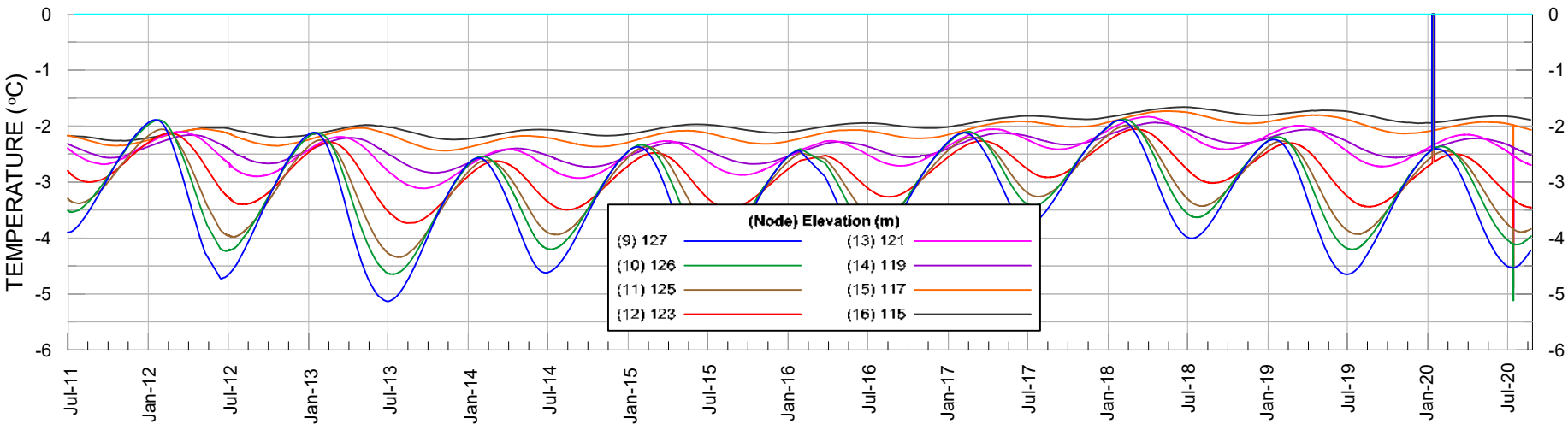
T13 (30+713) NODES 9 TO 16



T14 (30+827) NODES 1 TO 8



T14 (30+827) NODES 9 TO 16

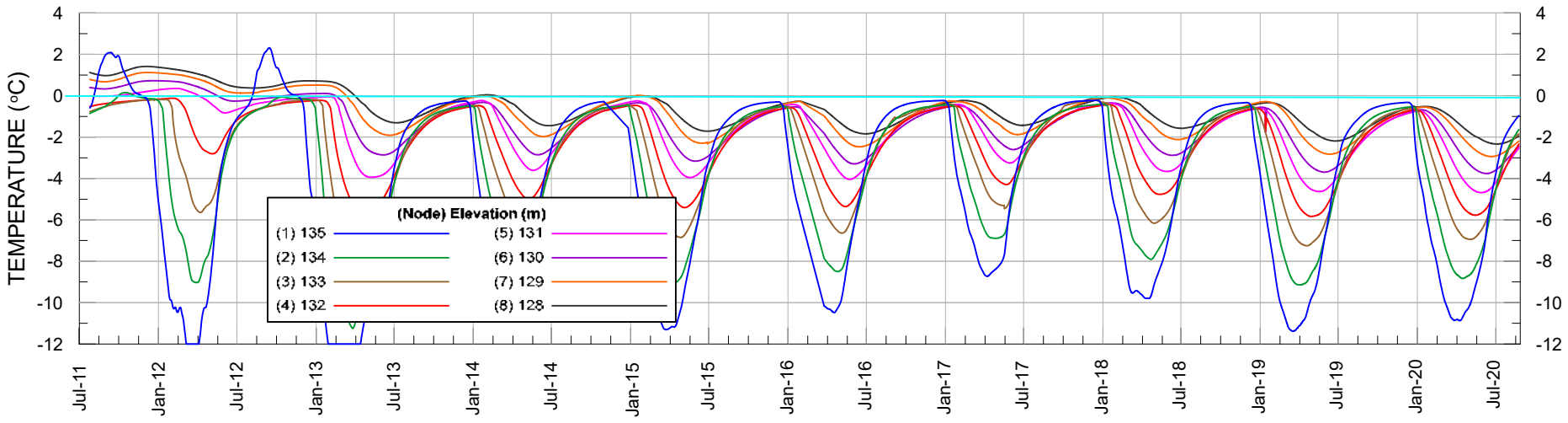


PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE NODAL THERMAL TIMELINES (July 1/11 to Aug 27/20)

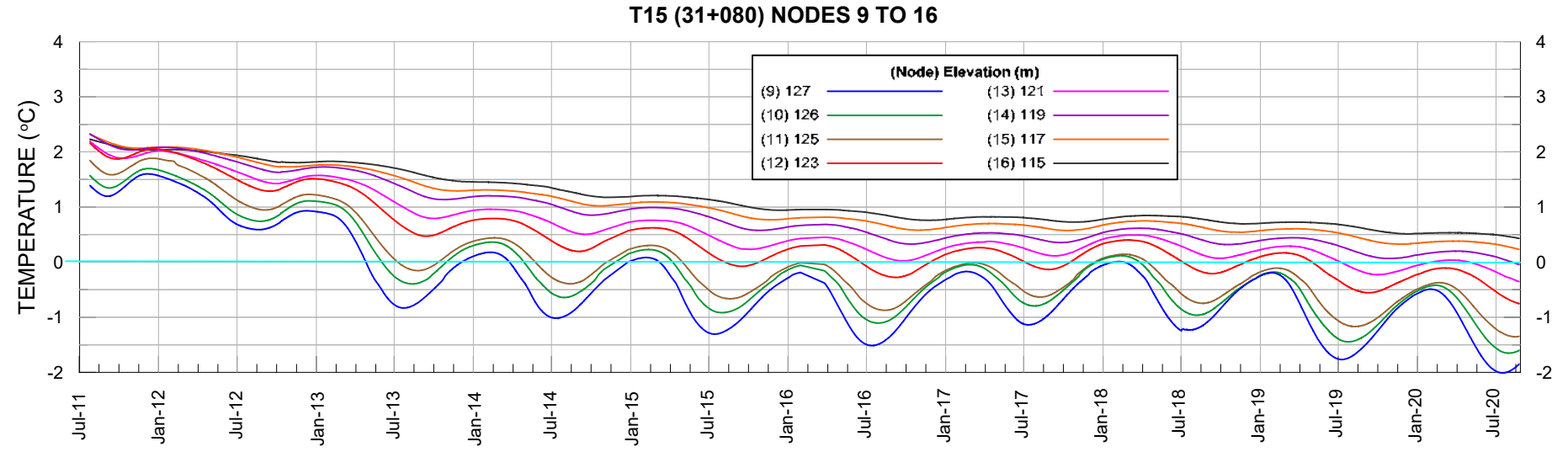
AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14	FIGURE 36	
CHECK				
REVIEW				

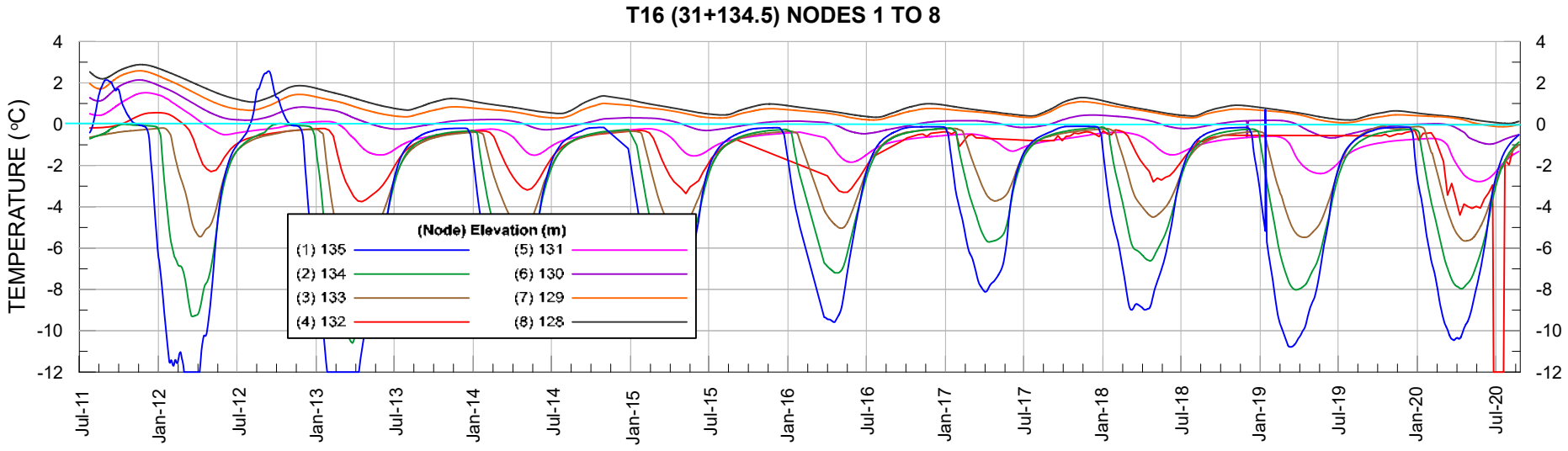
T15 (31+080) NODES 1 TO 8



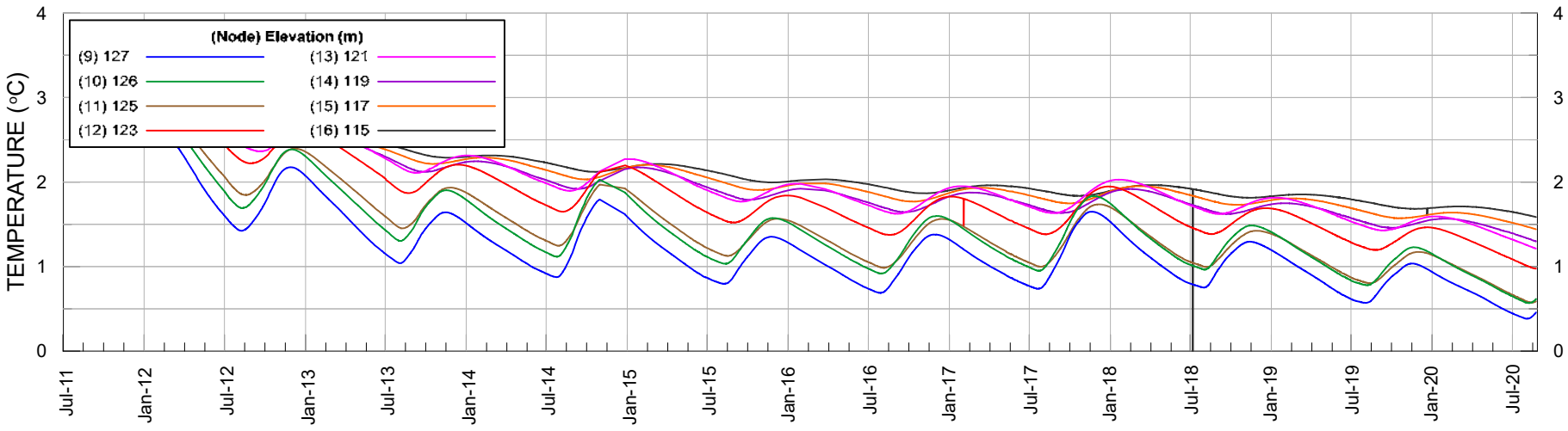
T15 (31+080) NODES 9 TO 16



T16 (31+134.5) NODES 1 TO 8



T16 (31+134.5) NODES 9 TO 16



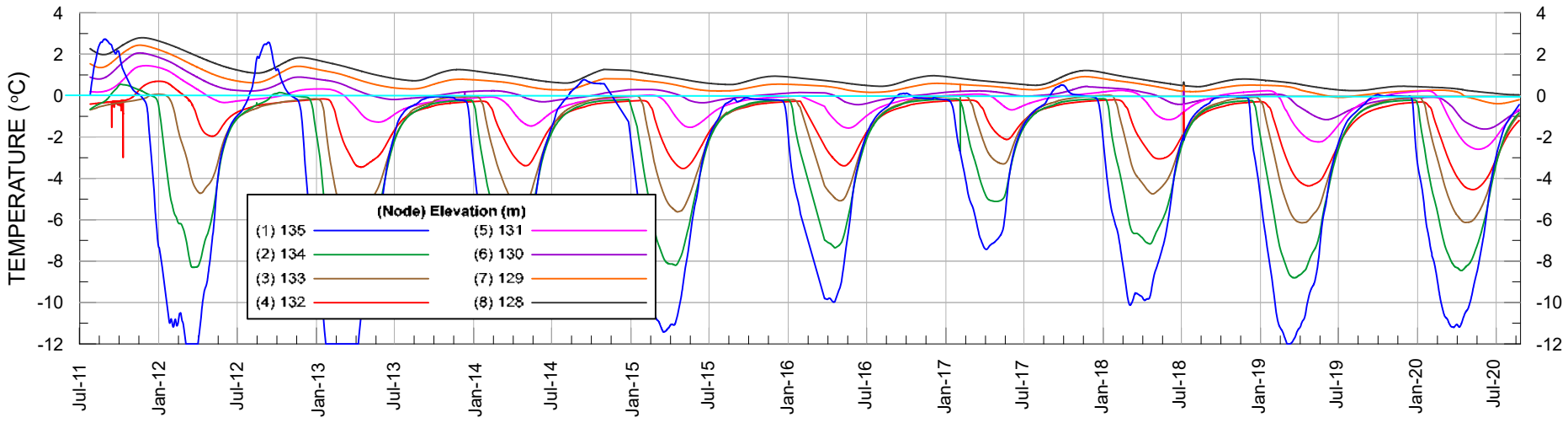
PROJECT
AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
BAYGOOSE DIKE
NODAL THERMAL TIMELINES T15-T16
(July 1/11 to Aug 27/20)

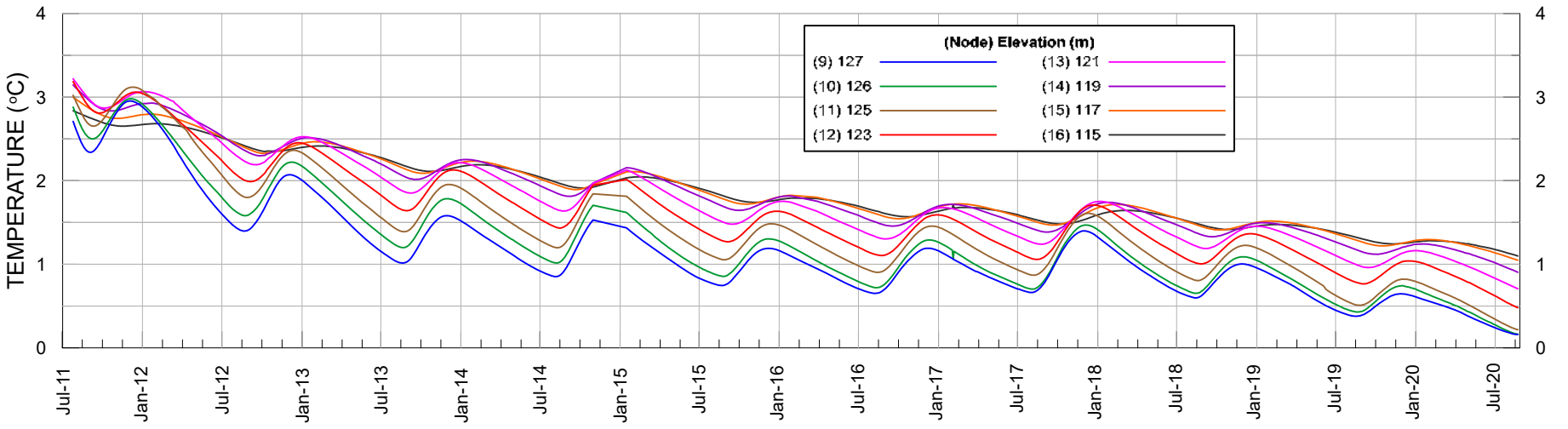
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14		
CHECK			**FIGURE 37**	
REVIEW				

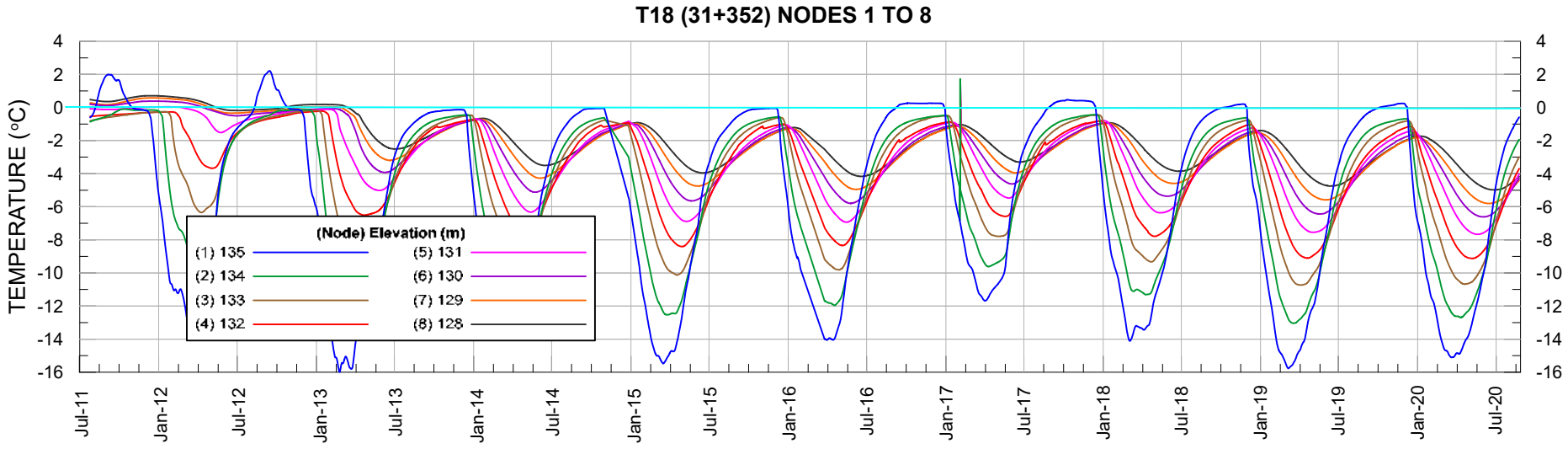
T17 (31+170) NODES 1 TO 8



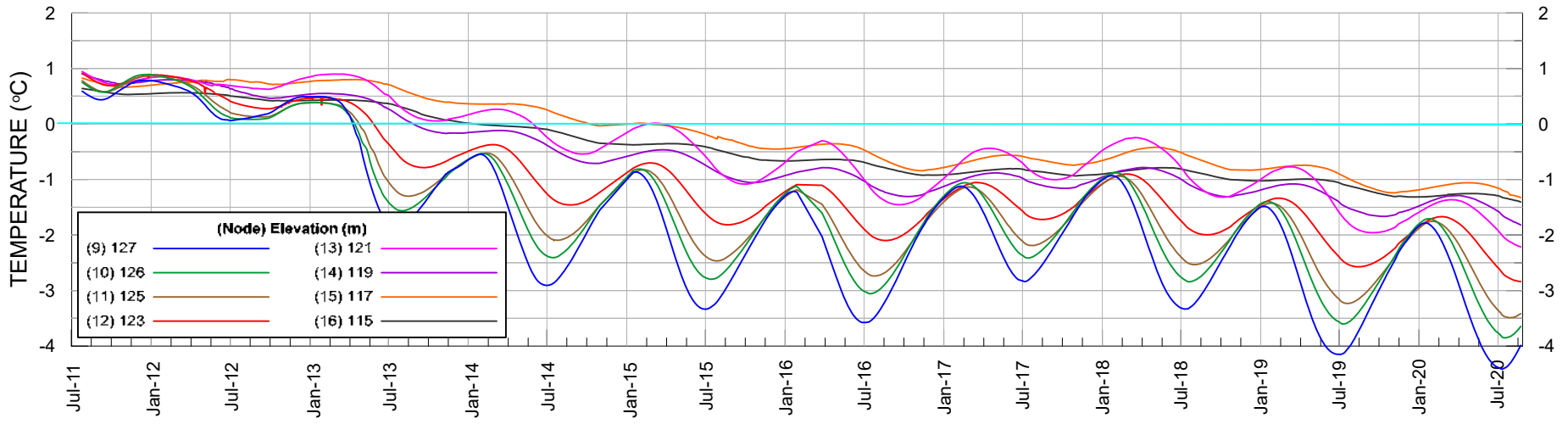
T17 (31+170) NODES 9 TO 16



T18 (31+352) NODES 1 TO 8



T18 (31+352) NODES 9 TO 16



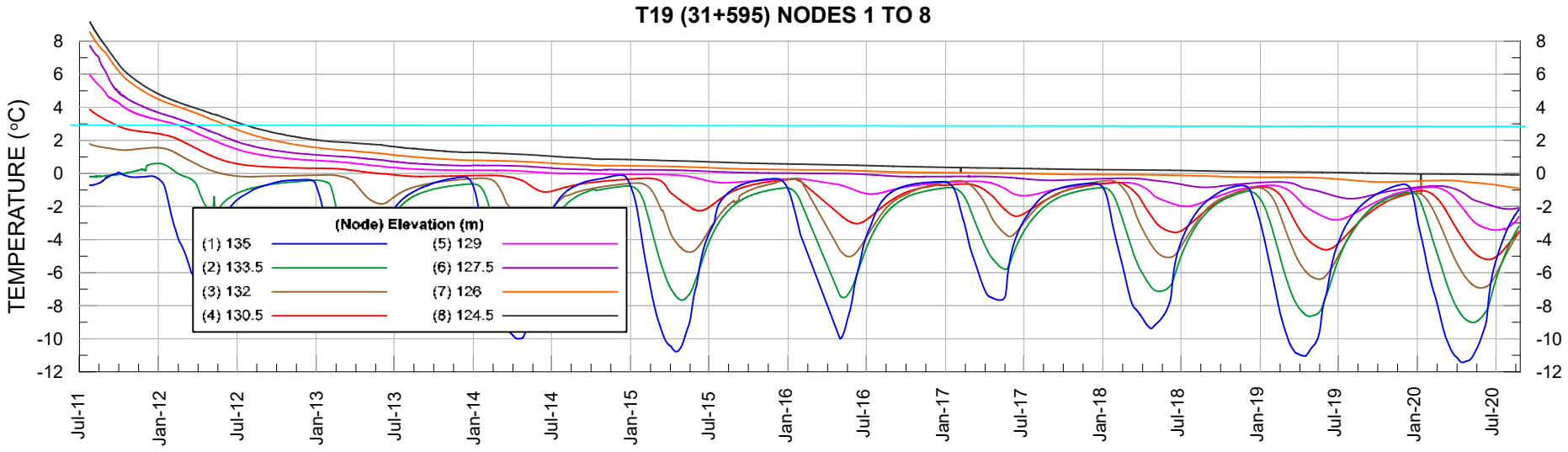
PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE: BAYGOOSE DIKE
NODAL THERMAL TIMELINES
(July 1/11 to Aug 27/20)

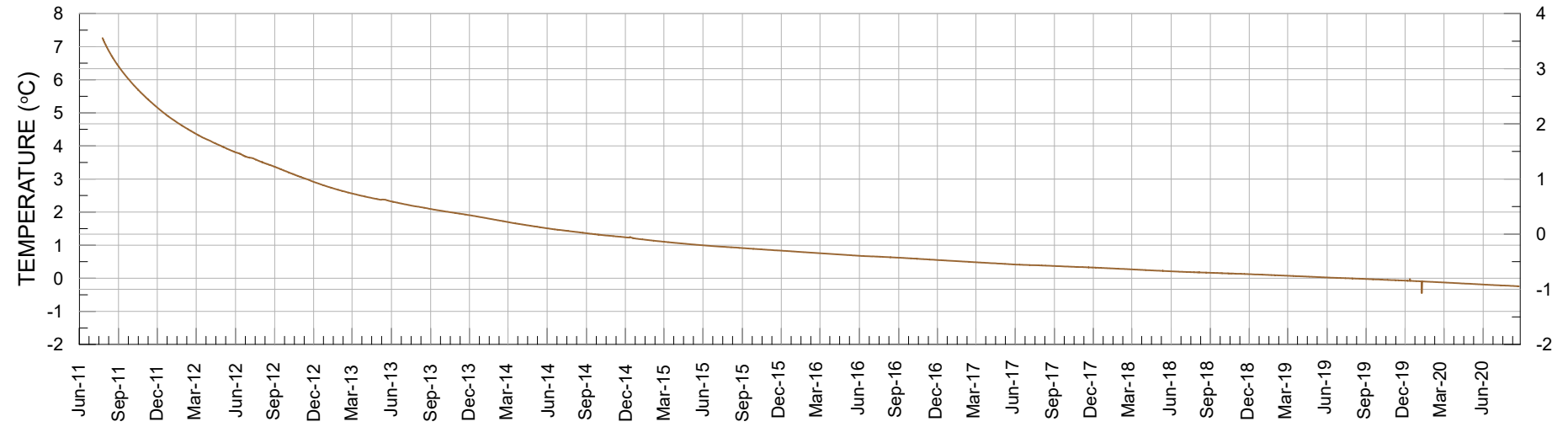
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14		
CHECK			FIGURE 38	
REVIEW				

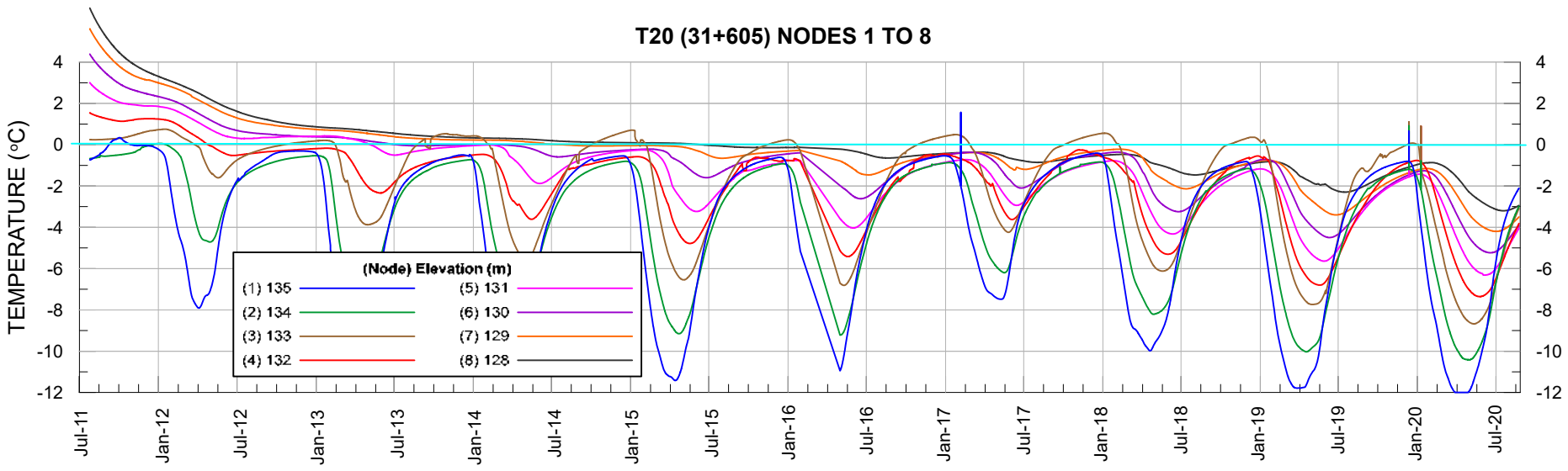
T19 (31+595) NODES 1 TO 8



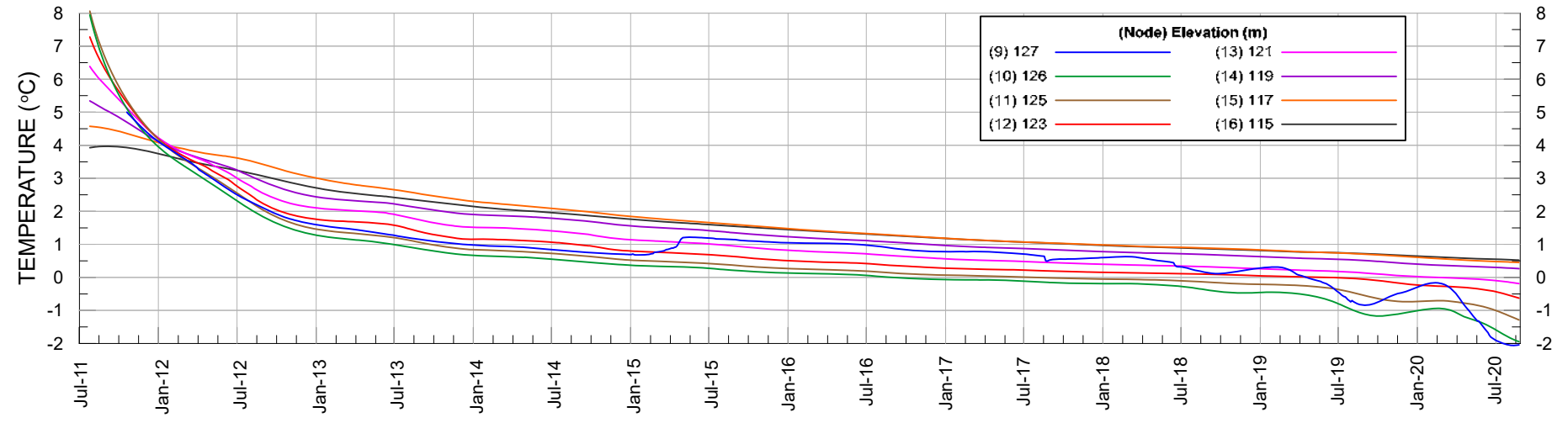
T19 (31+595) NODE 11



T20 (31+605) NODES 1 TO 8



T20 (31+605) NODES 9 TO 16

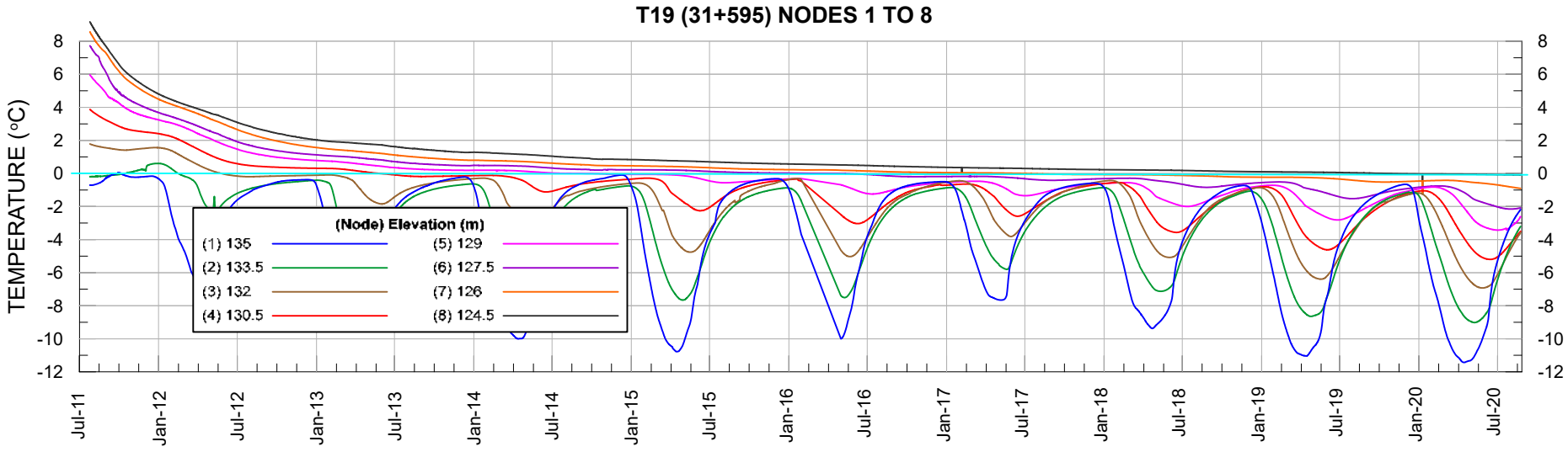


PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE NODAL THERMAL TIMELINES (July 1/11 to Aug 27/20)

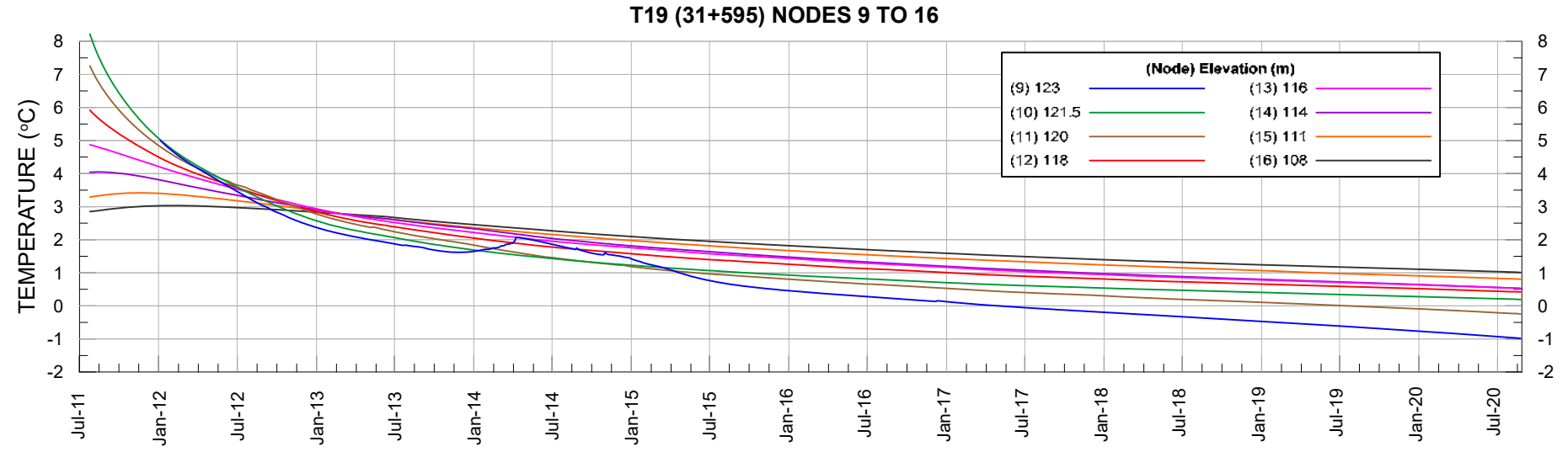
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14	FIGURE 39	
CHECK				
REVIEW				

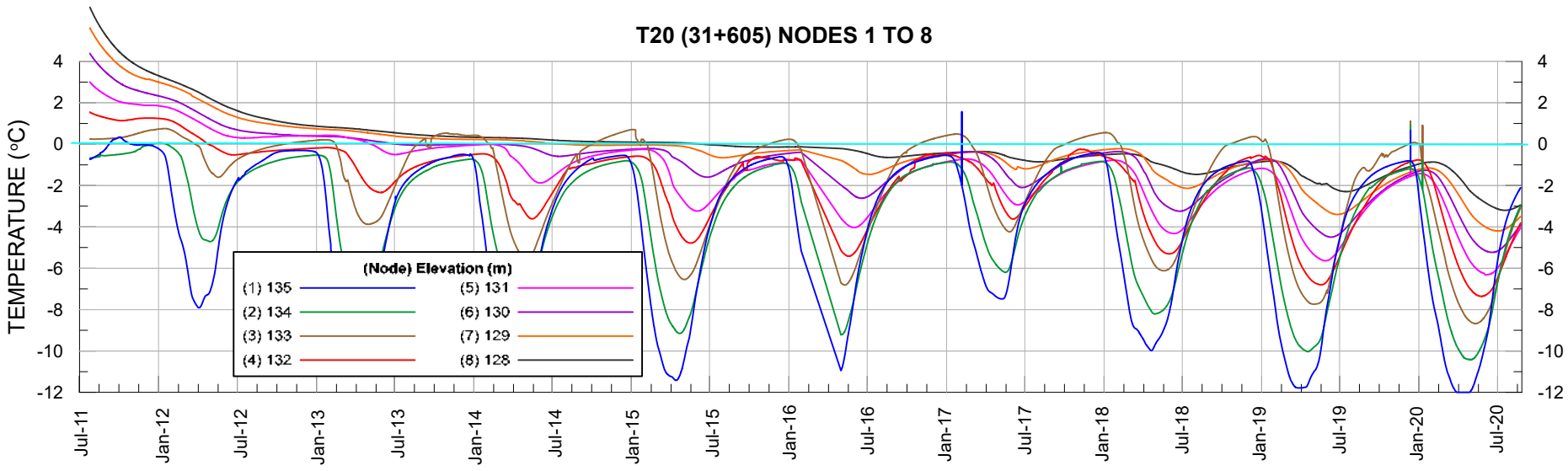
T19 (31+595) NODES 1 TO 8



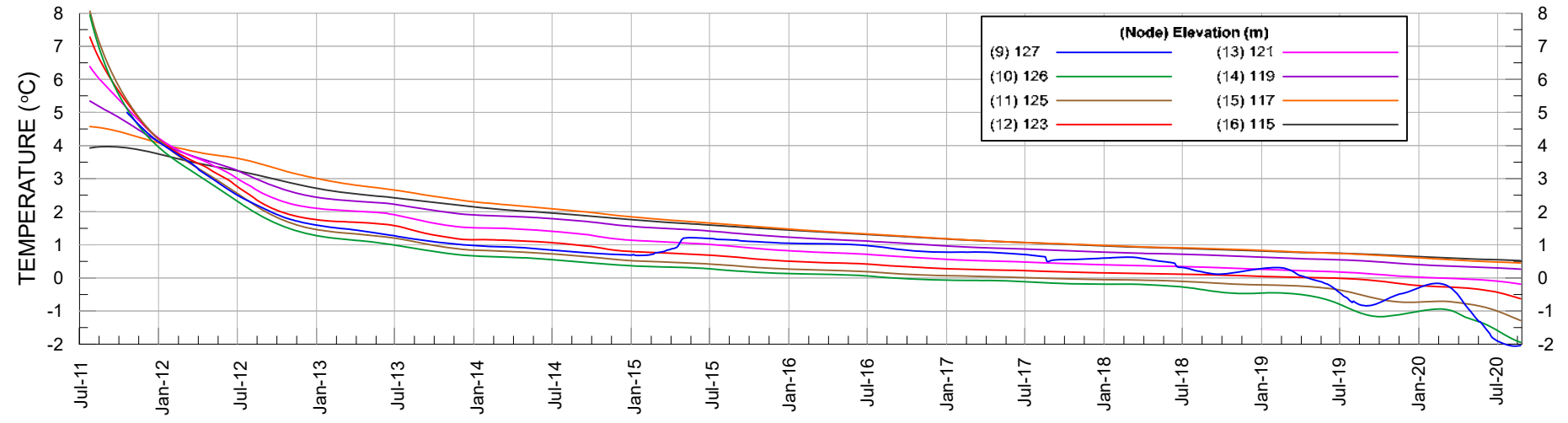
T19 (31+595) NODES 9 TO 16



T20 (31+605) NODES 1 TO 8



T20 (31+605) NODES 9 TO 16

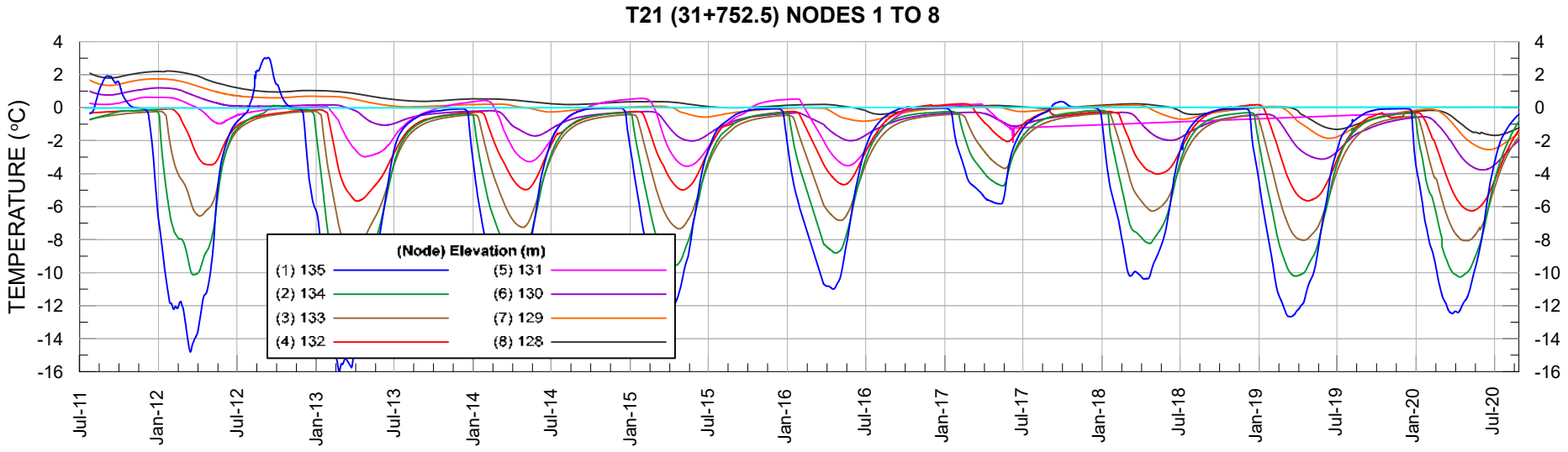


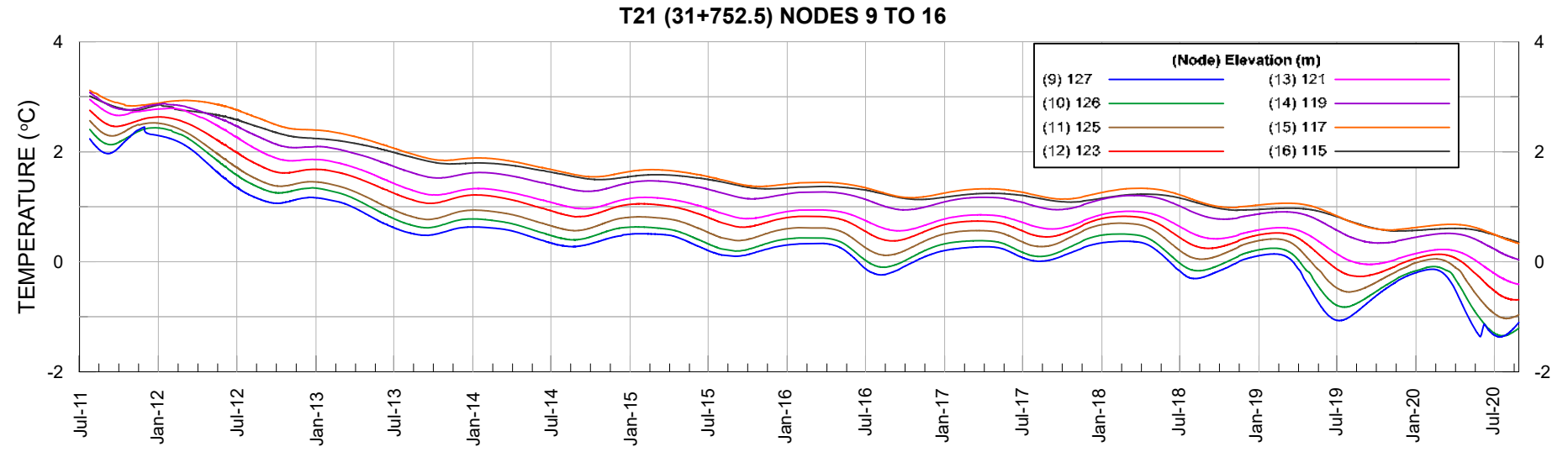
PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

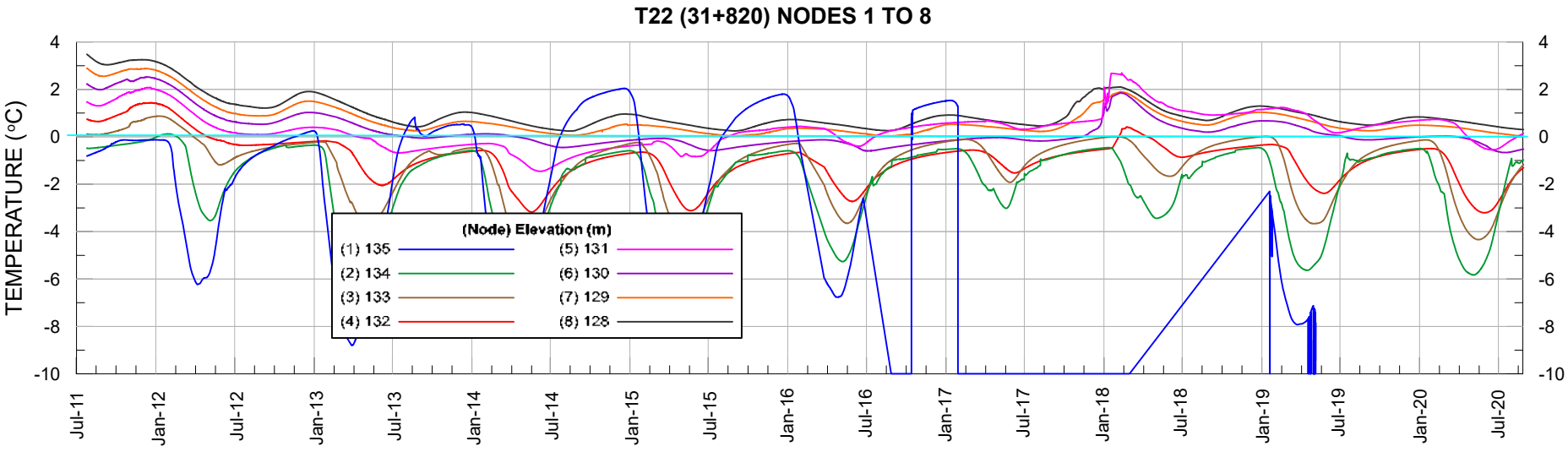
TITLE: BAYGOOSE DIKE
NODAL THERMAL TIMELINES
(July 1/11 to Aug 27/20)

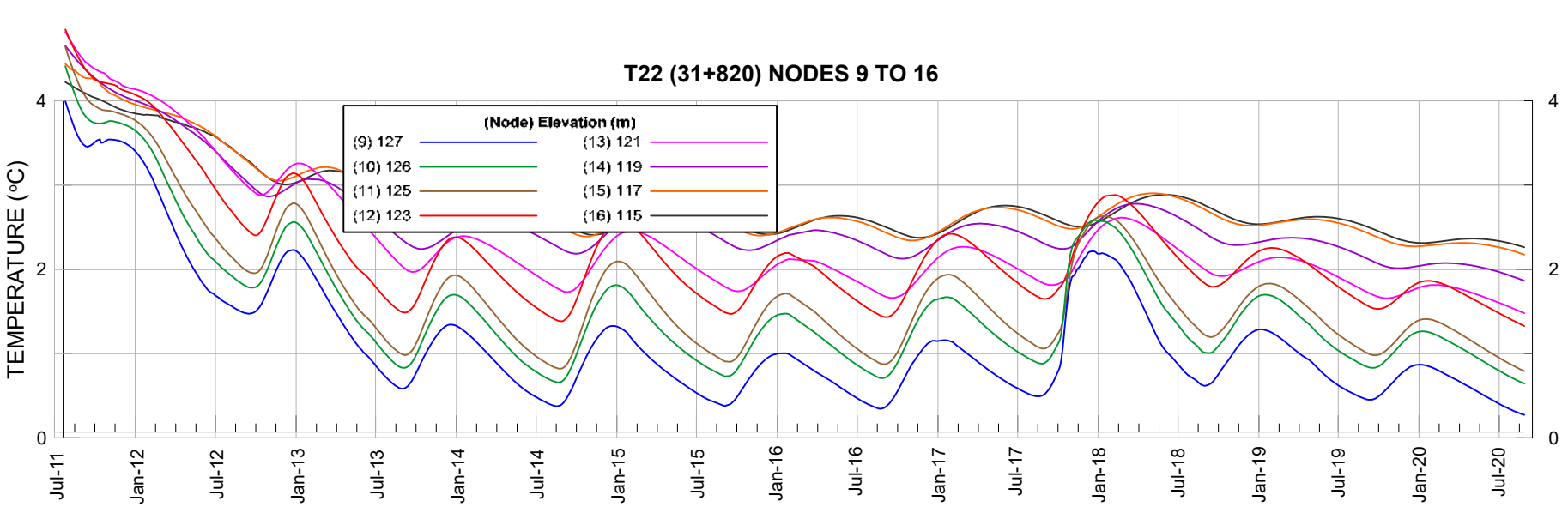
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.
DESIGN	TD	20JAN14	SCALE AS SHOWN REV.
CADD	TD	20JAN14	
CHECK			FIGURE 39
REVIEW			







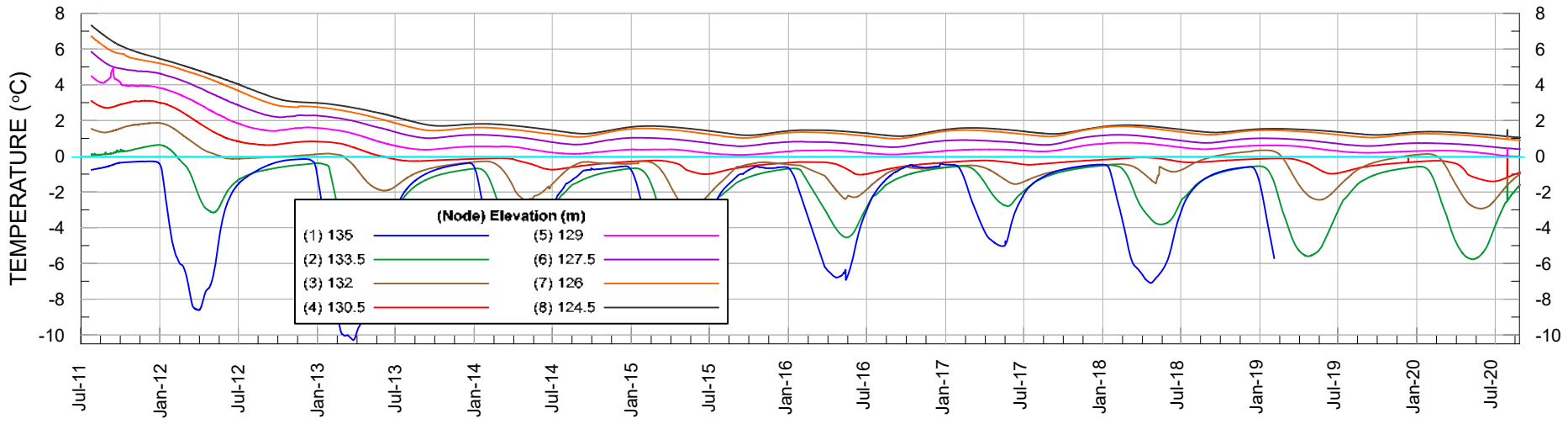


PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE NODAL THERMAL TIMELINES (July 1/11 to Aug 27/20)

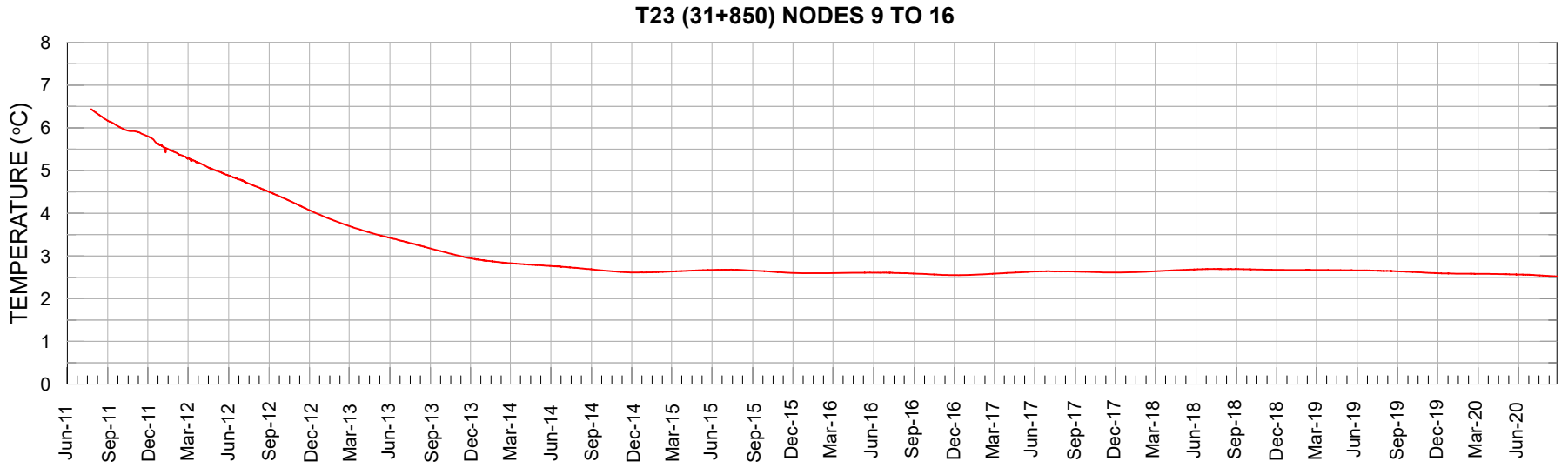
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.		
DESIGN	TD	20JAN14	SCALE AS SHOWN		REV.
CADD	TD	20JAN14	FIGURE 40		
CHECK					
REVIEW					

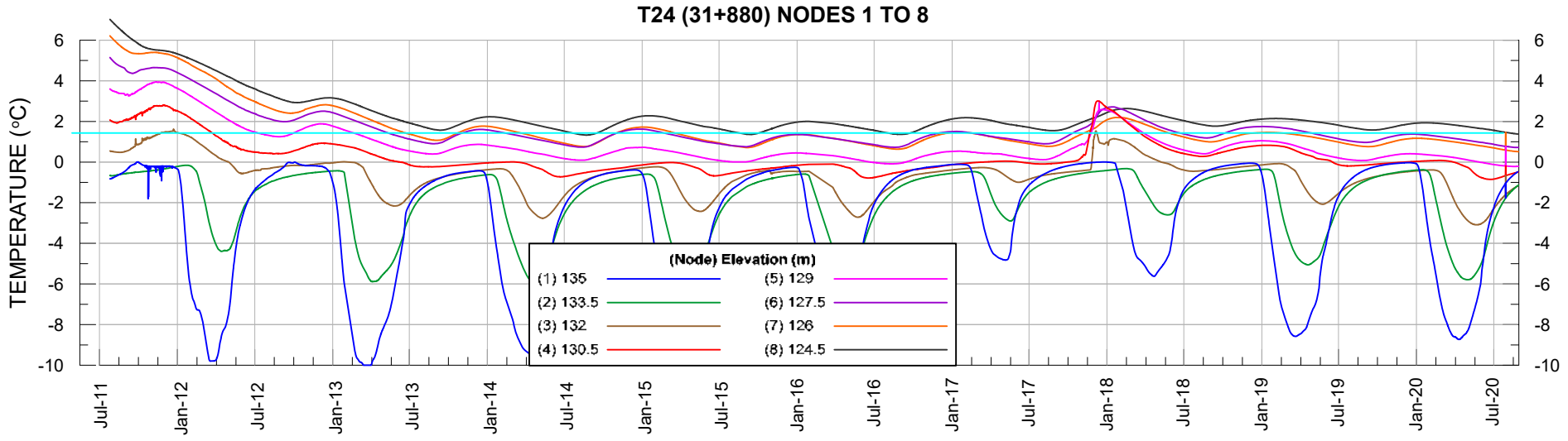
T23 (31+850) NODES 1 TO 8



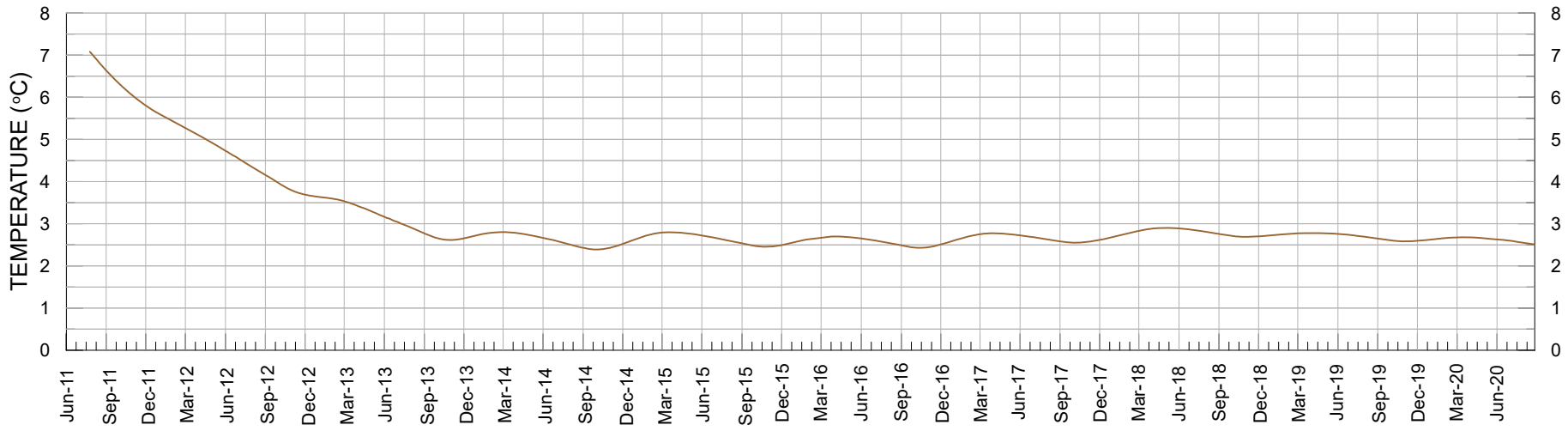
T23 (31+850) NODES 9 TO 16



T24 (31+880) NODES 1 TO 8



T24 (31+880) NODE 11

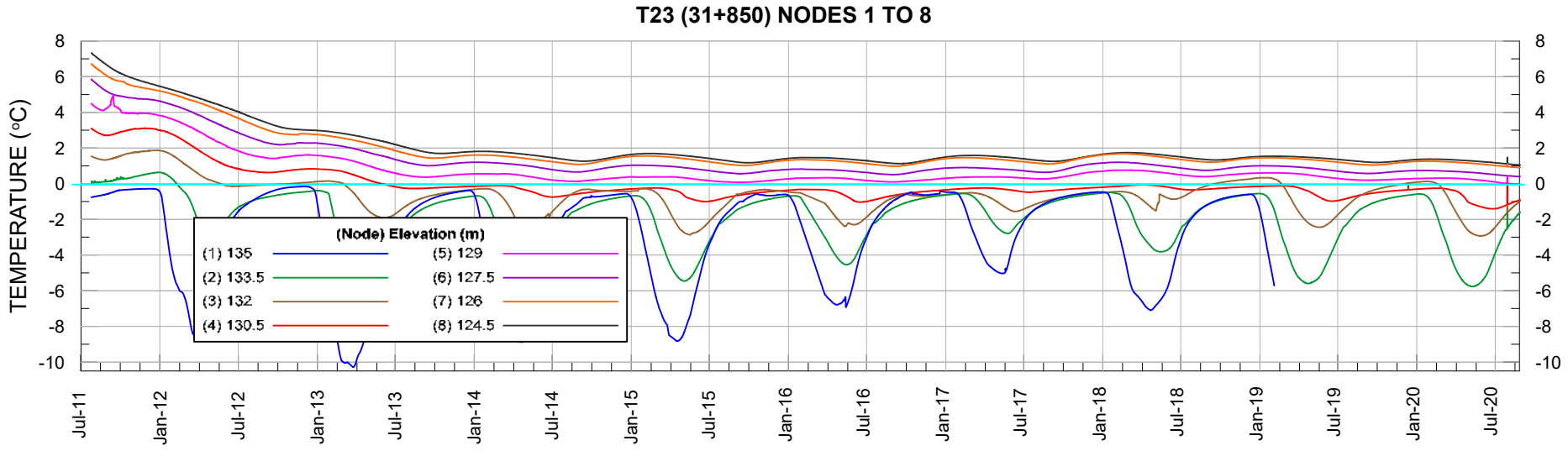


PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE (July 1/11 to Aug 27/20)

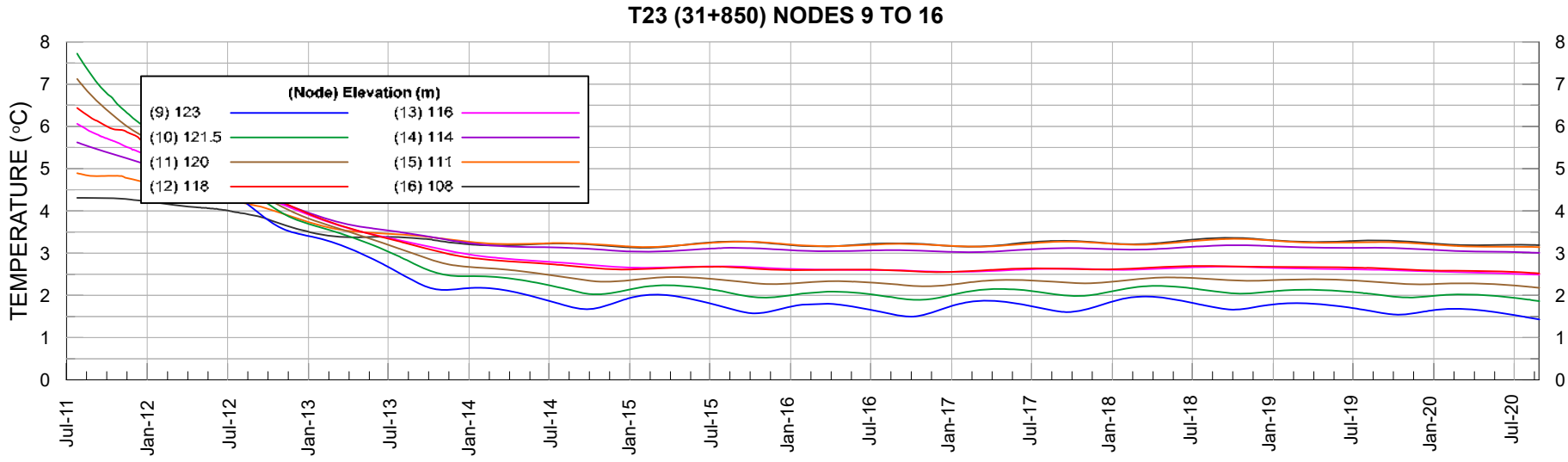
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14	FIGURE 41	
CHECK				
REVIEW				

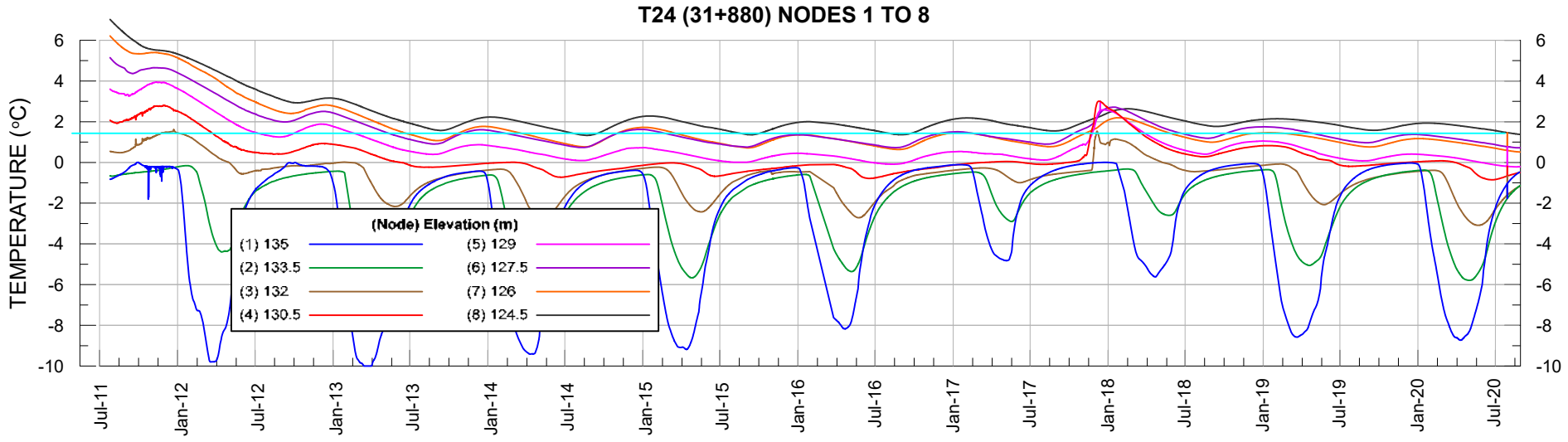
T23 (31+850) NODES 1 TO 8



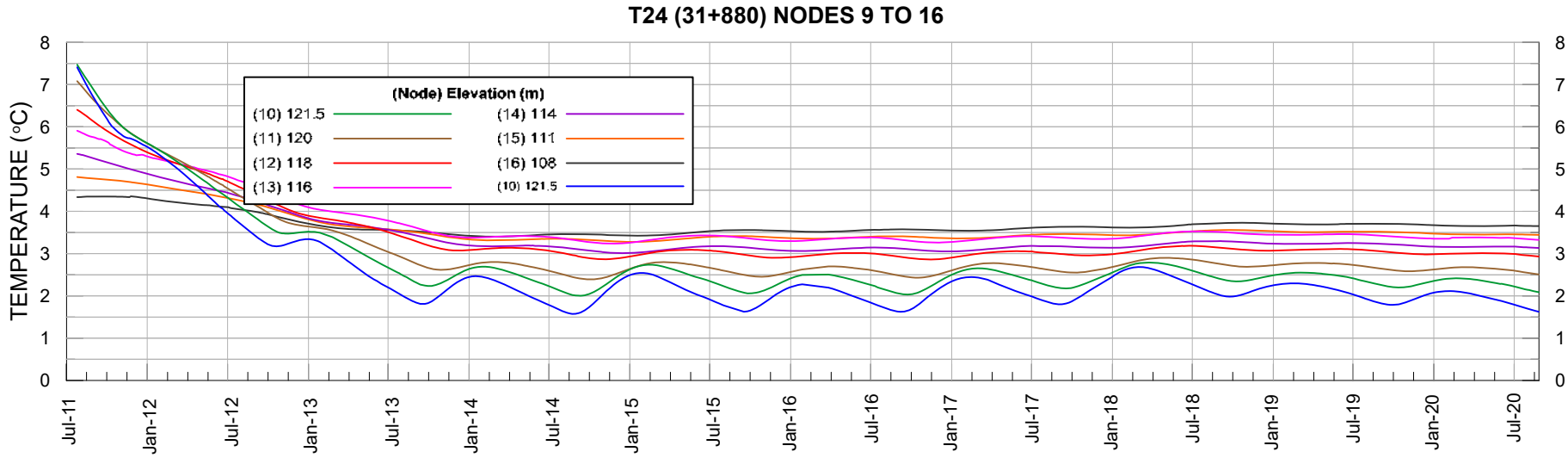
T23 (31+850) NODES 9 TO 16



T24 (31+880) NODES 1 TO 8



T24 (31+880) NODES 9 TO 16

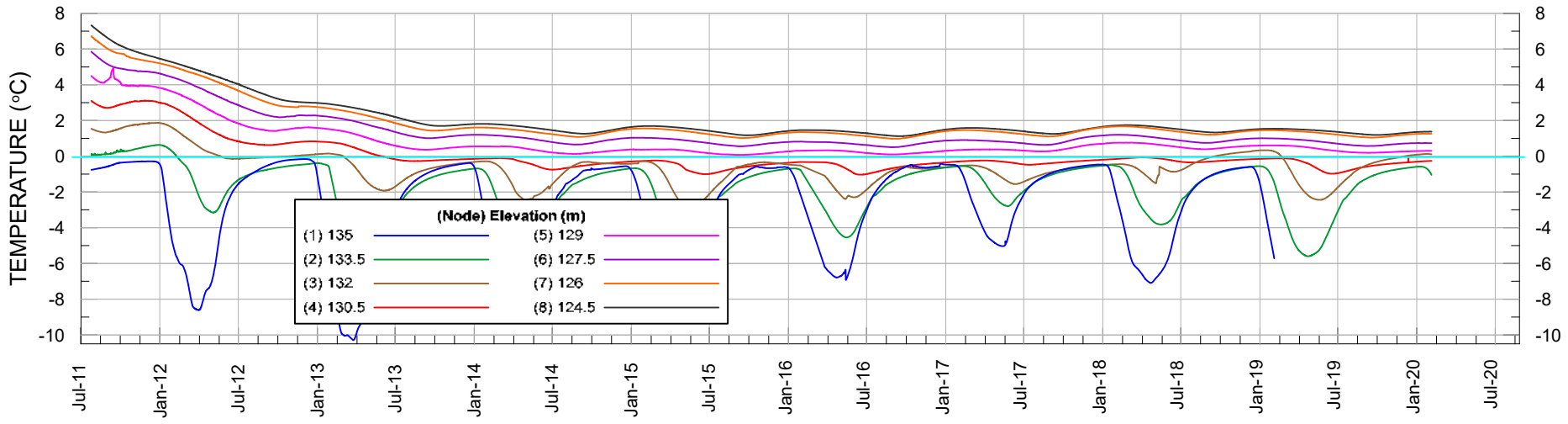


PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE NODAL THERMAL TIMELINES (July 1/11 to Aug 27/20)

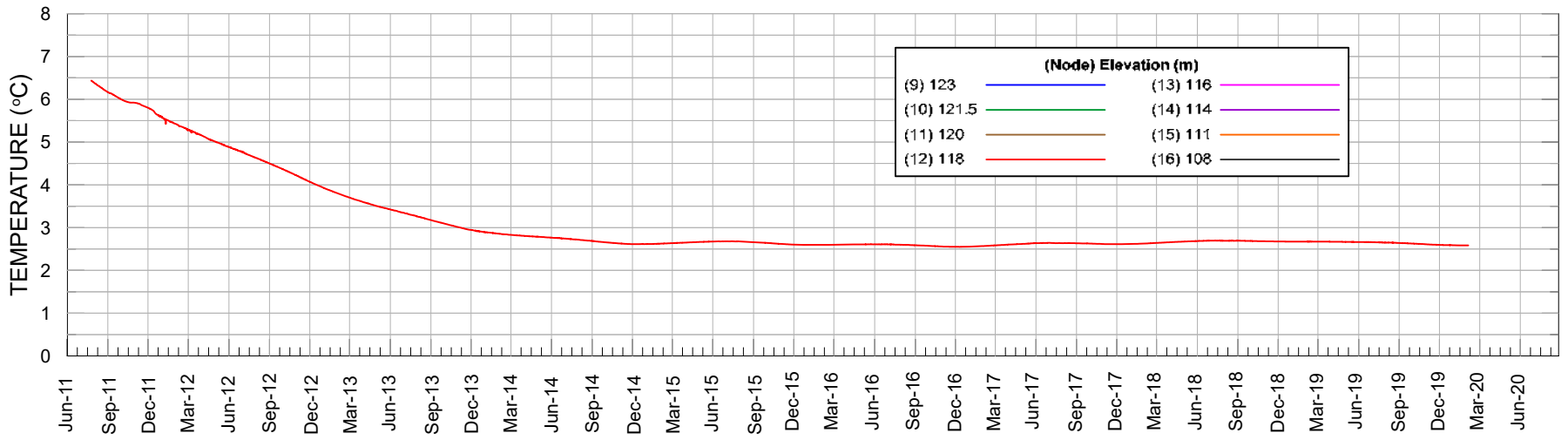
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14	FIGURE 41	
CHECK				
REVIEW				

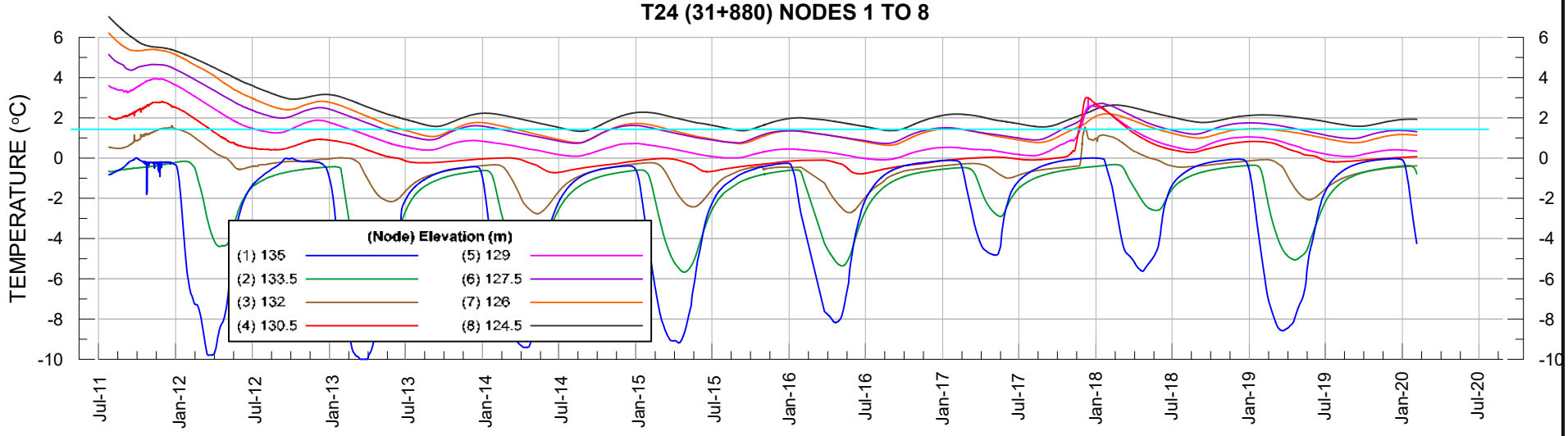
T23 (31+850) NODES 1 TO 8



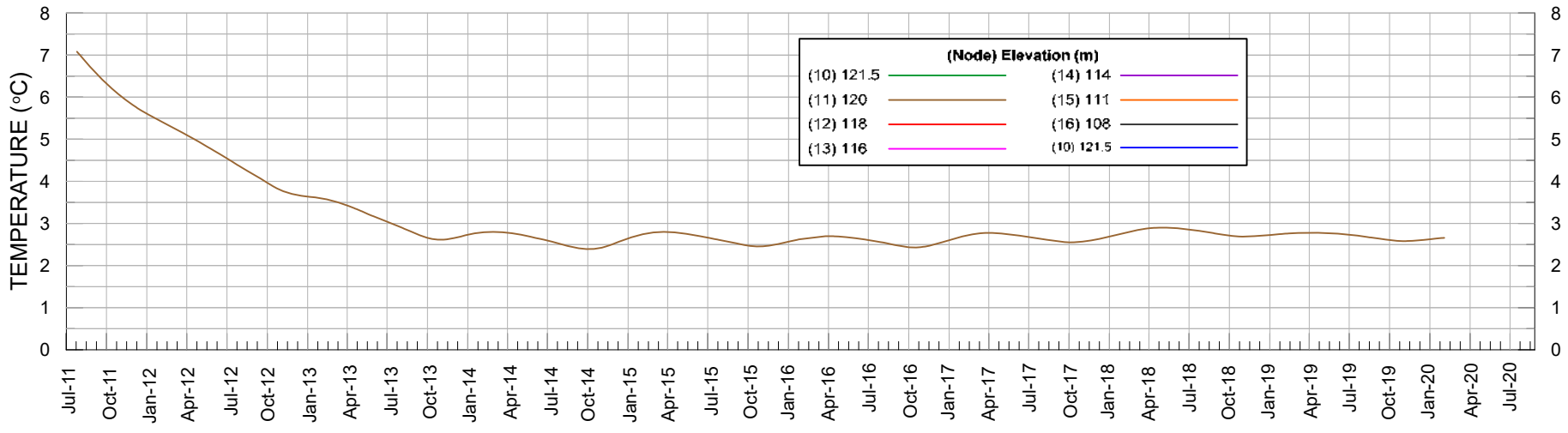
T23 (31+850) NODES 9 TO 16



T24 (31+880) NODES 1 TO 8



T24 (31+880) NODES 9 TO 16

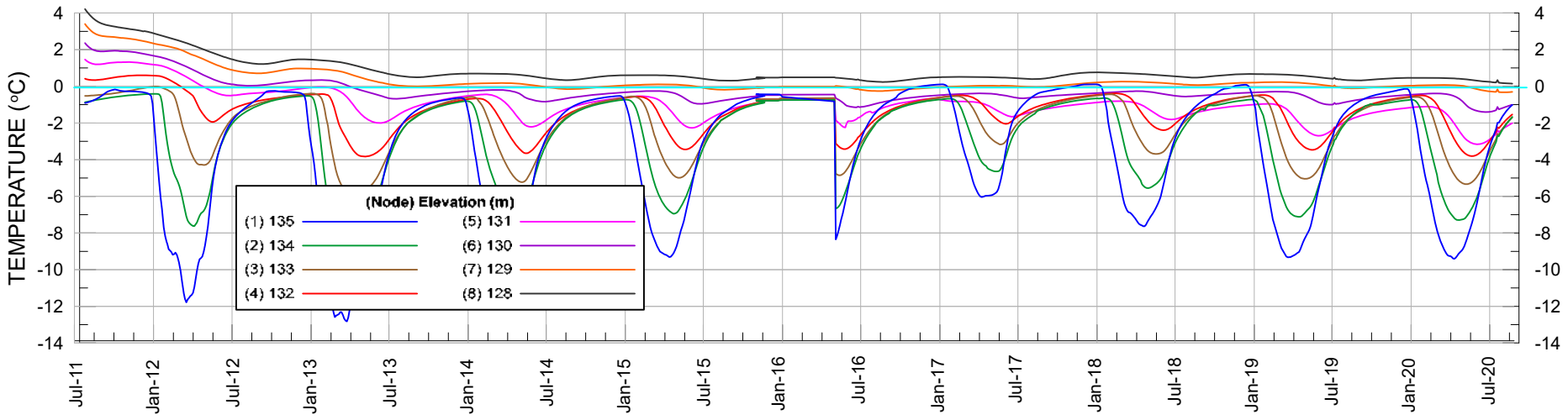


PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE (July 1/11 to Aug 27/20)

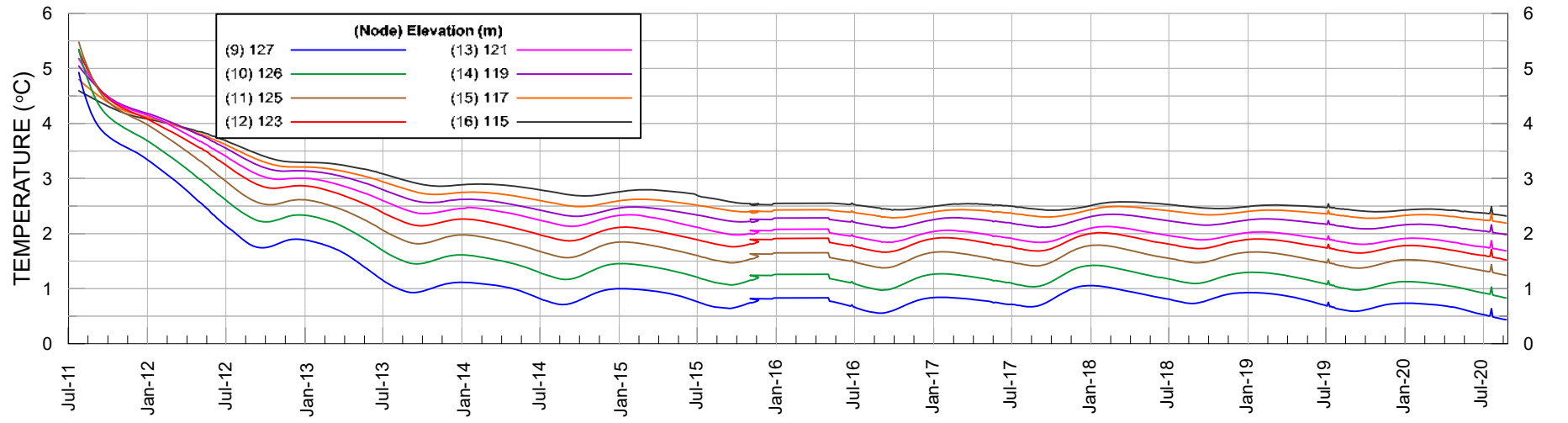
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14		
CHECK			FIGURE 41	
REVIEW				

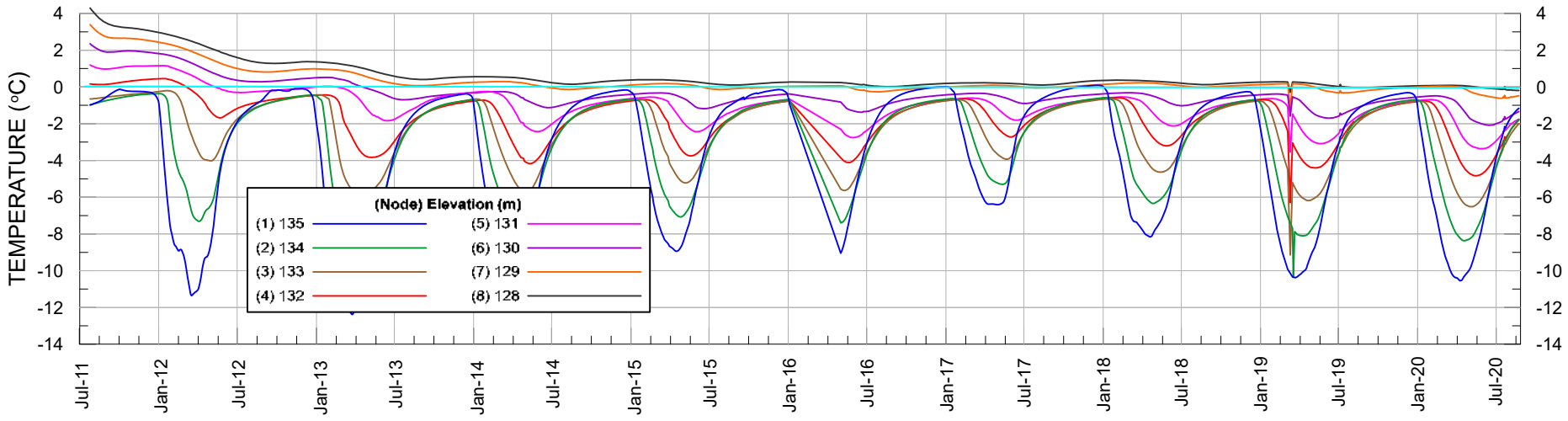
T25 (31+960) NODES 1 TO 8



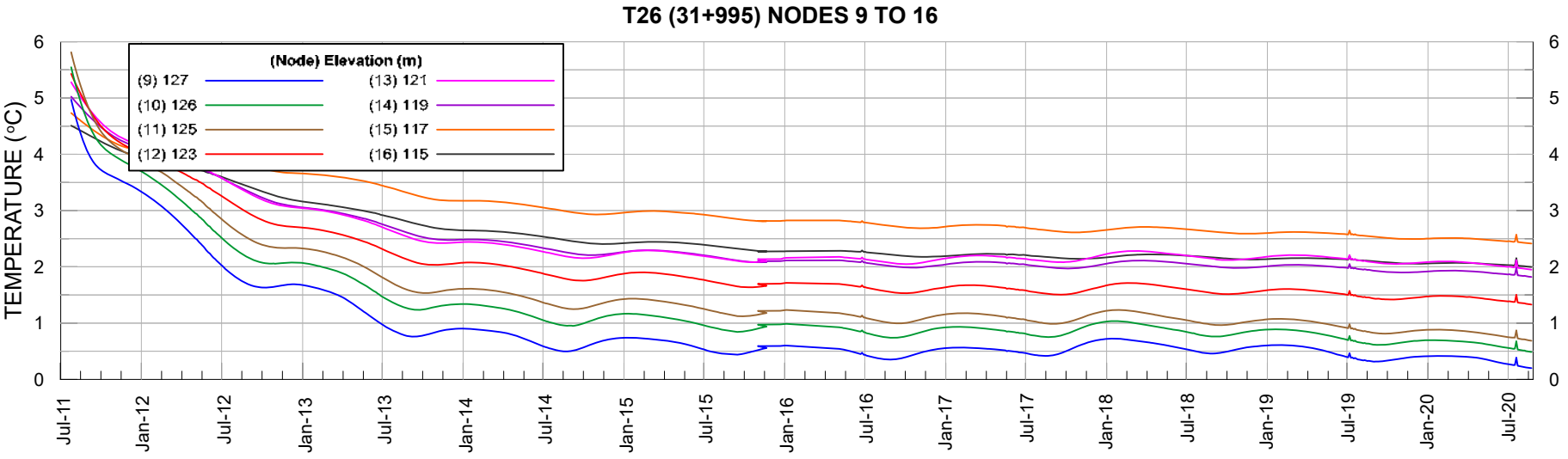
T25 (31+960) NODES 9 TO 16



T26 (31+995) NODES 1 TO 8



T26 (31+995) NODES 9 TO 16

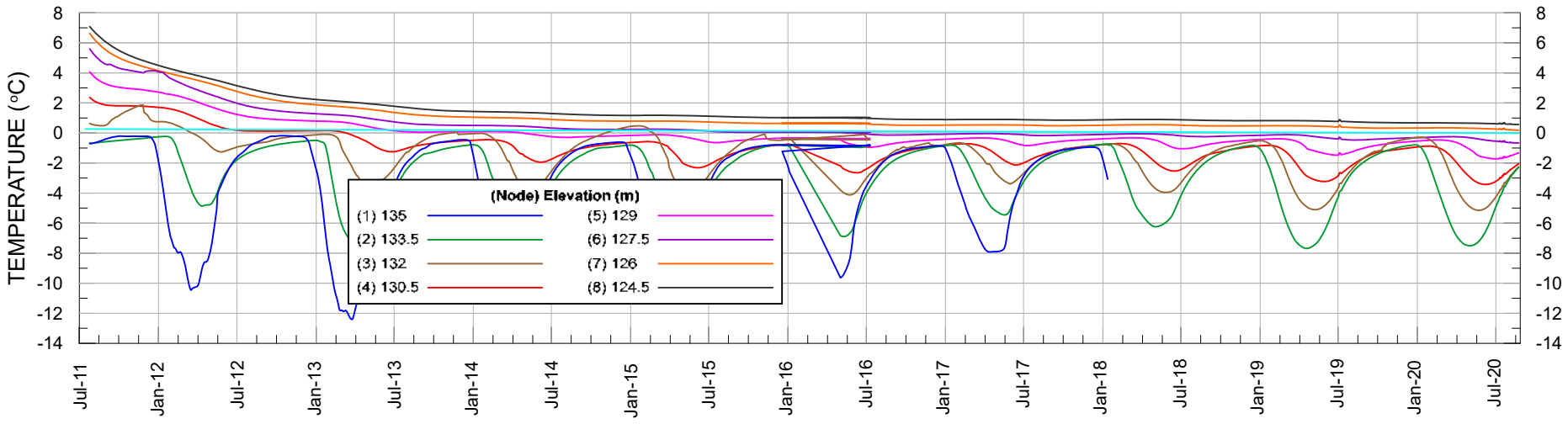


PROJECT	**AGNICO EAGLE MINES LIMITED** **MEADOWBANK GOLD PROJECT** **NUNAVUT**
TITLE	**BAYGOOSE DIKE** **NODAL THERMAL TIMELINES** **(July 1/11 to Aug 27/20)**

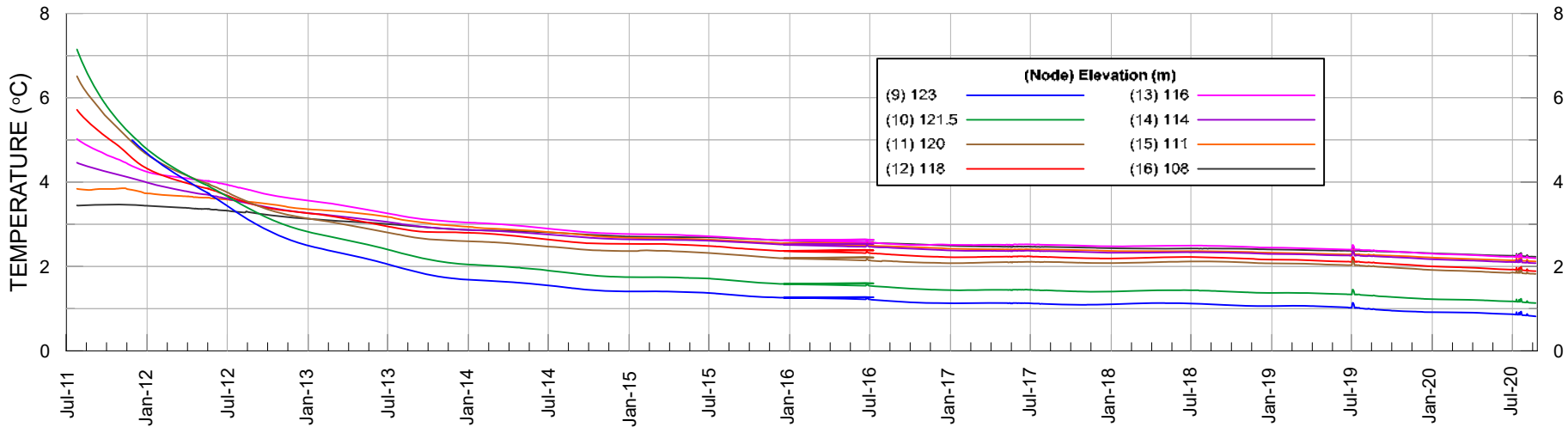
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14		
CHECK			**FIGURE 42**	
REVIEW				

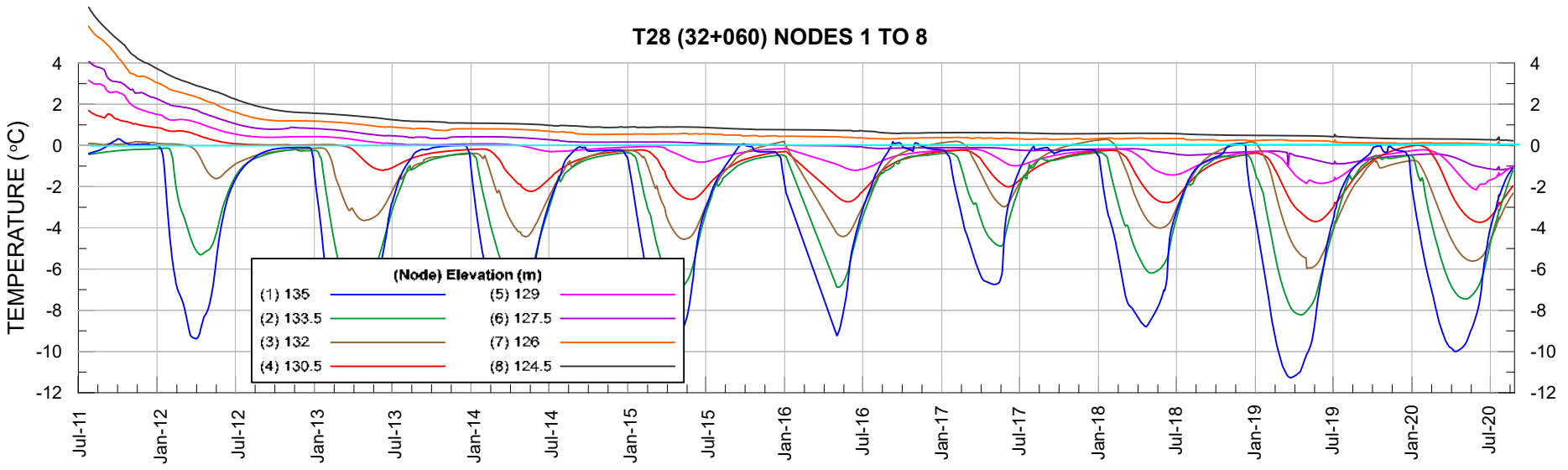
T27 (32+030) NODES 1 TO 8



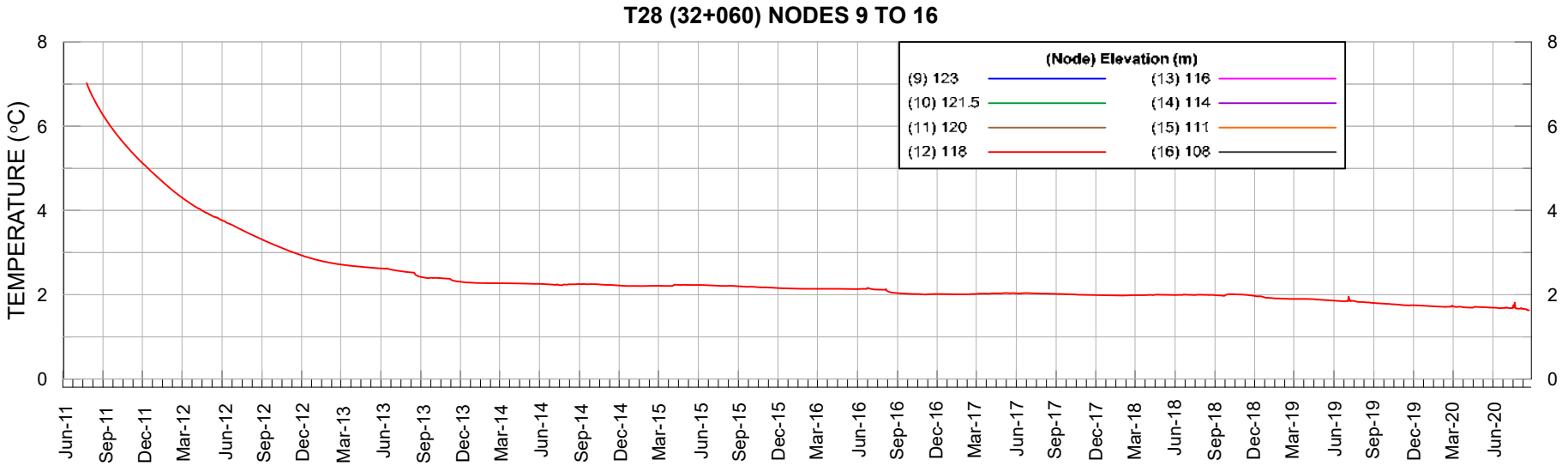
T27 (32+030) NODES 9 TO 16



T28 (32+060) NODES 1 TO 8



T28 (32+060) NODES 9 TO 16

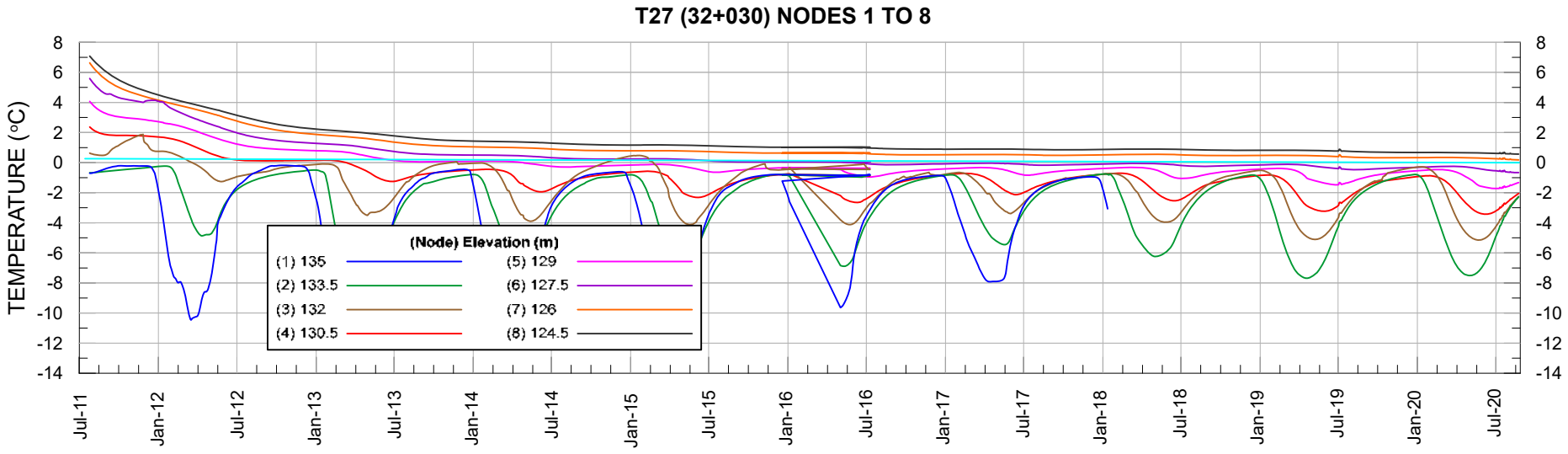


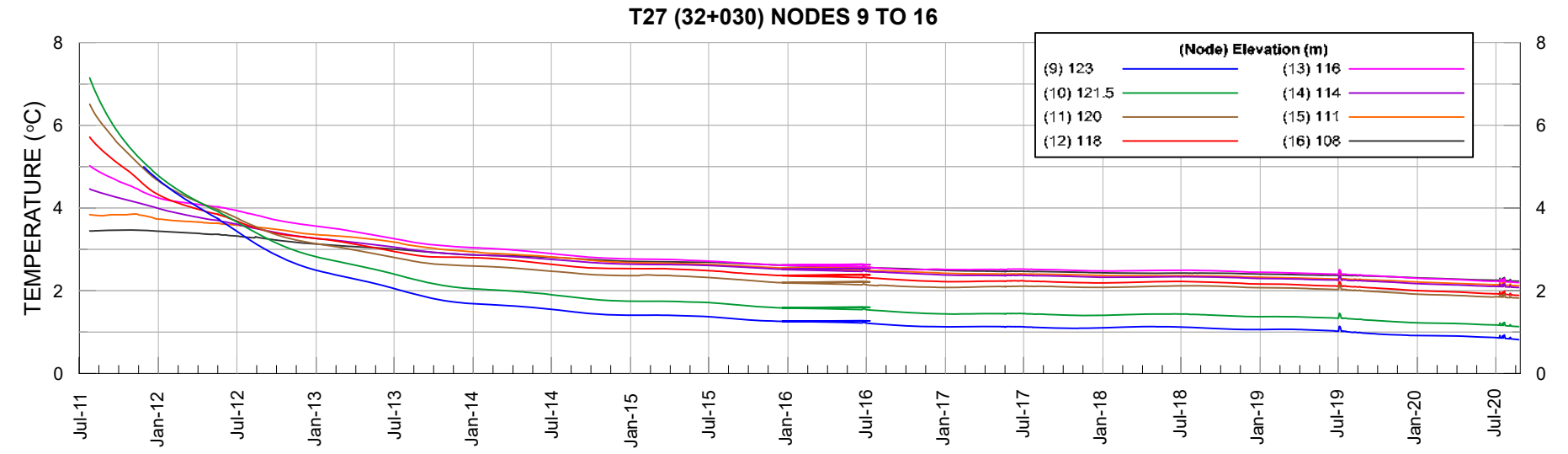
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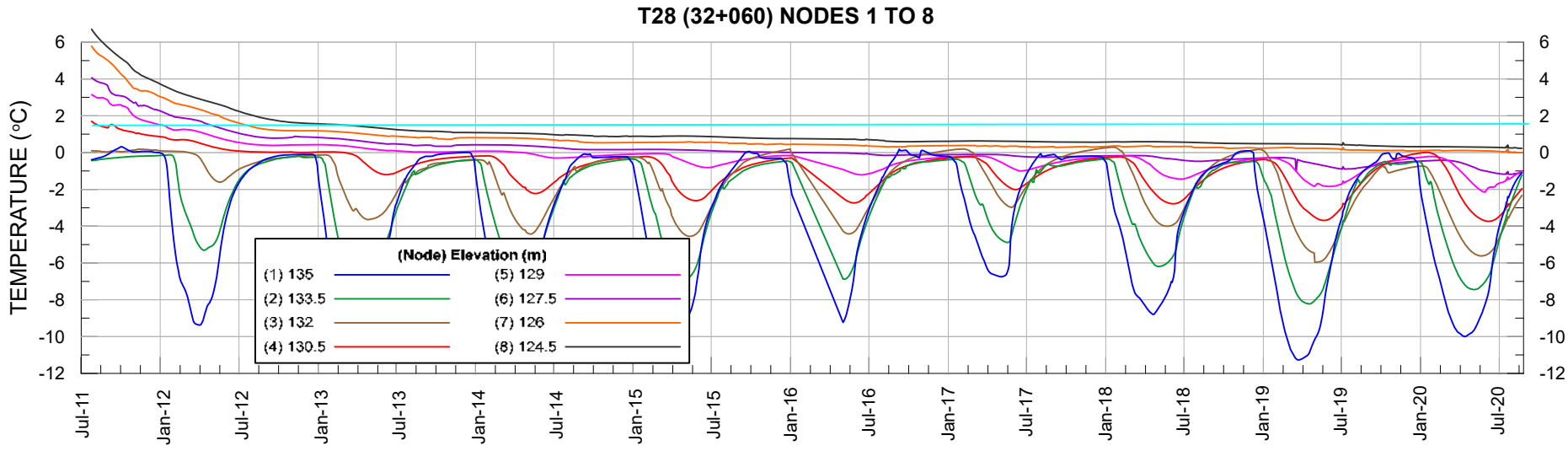
PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE NODAL THERMAL TIMELINES (July 1/11 to Aug 27/20)

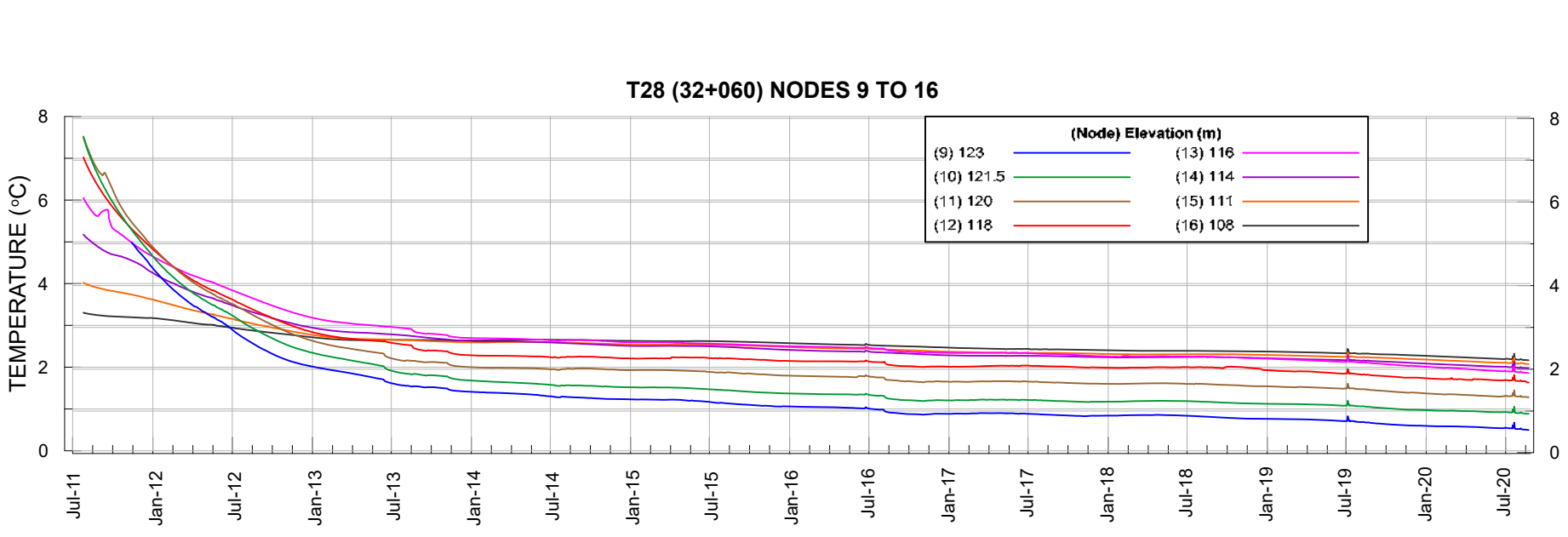
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	17JAN14	SCALE AS SHOWN	REV.
CADD	TD	17JAN14		
CHECK			FIGURE 43	
REVIEW				









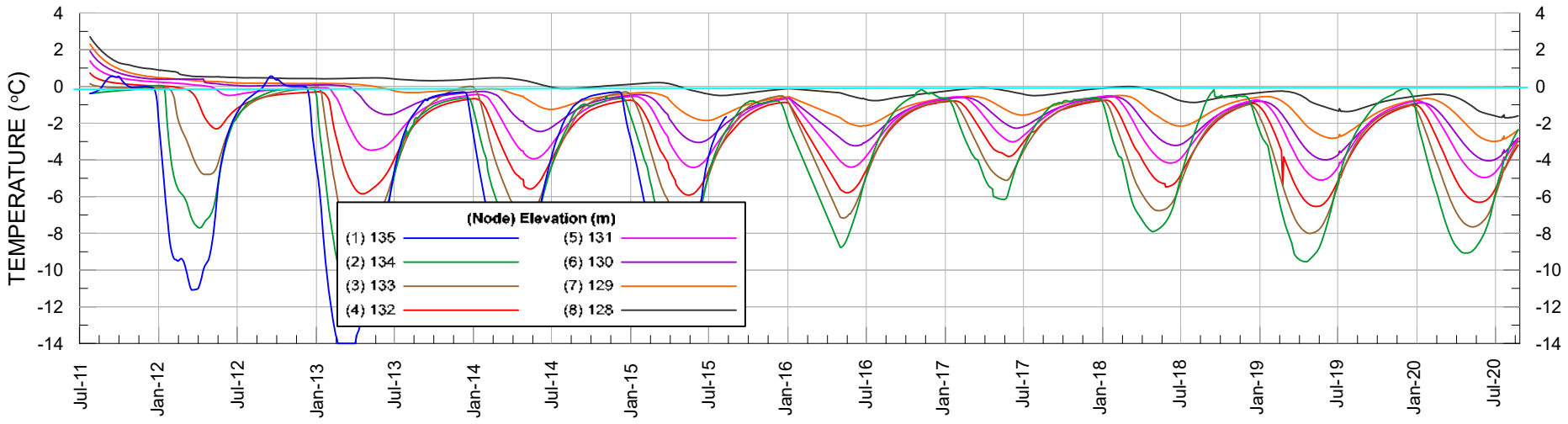
Note:

PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE NODAL THERMAL TIMELINES (July 1/11 to Aug 27/20)

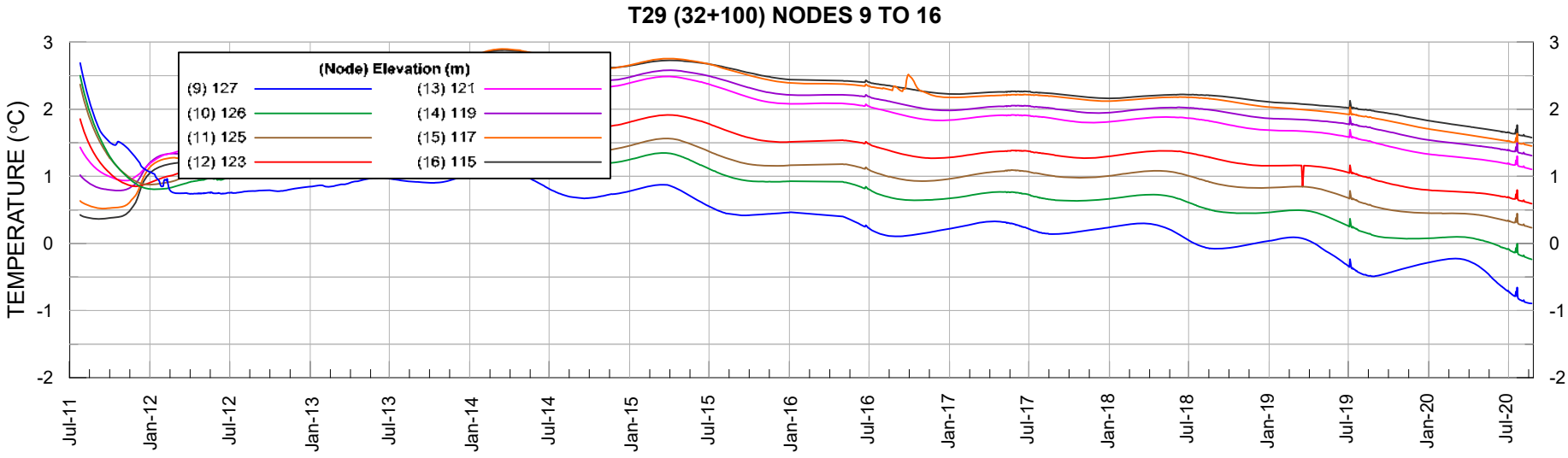
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	17JAN14	SCALE AS SHOWN	REV.
CADD	TD	17JAN14	FIGURE 43	
CHECK				
REVIEW				

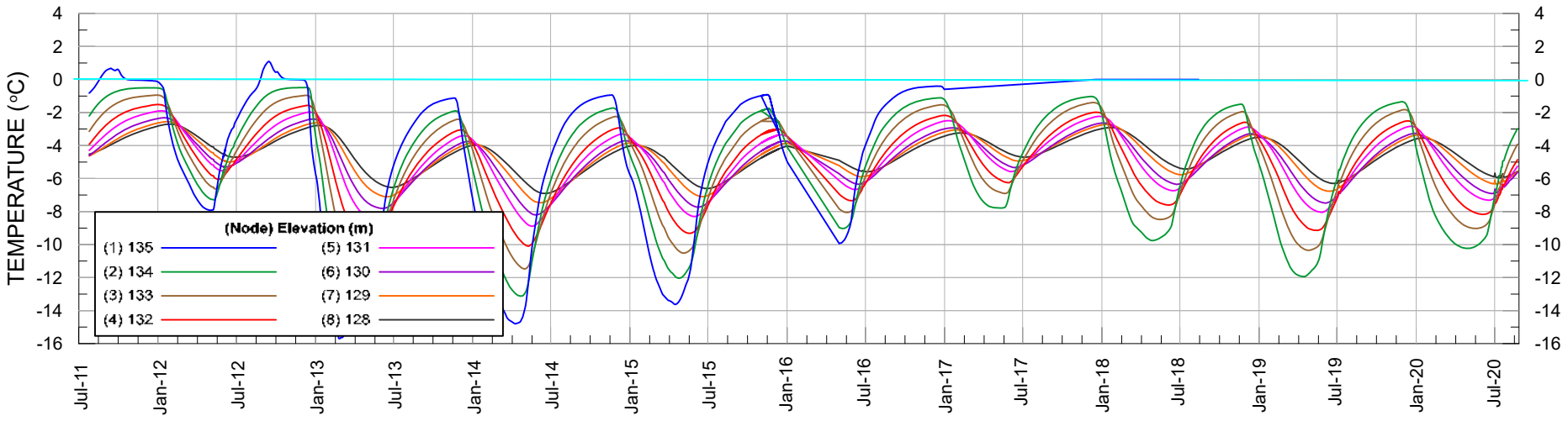
T29 (32+100) NODES 1 TO 8



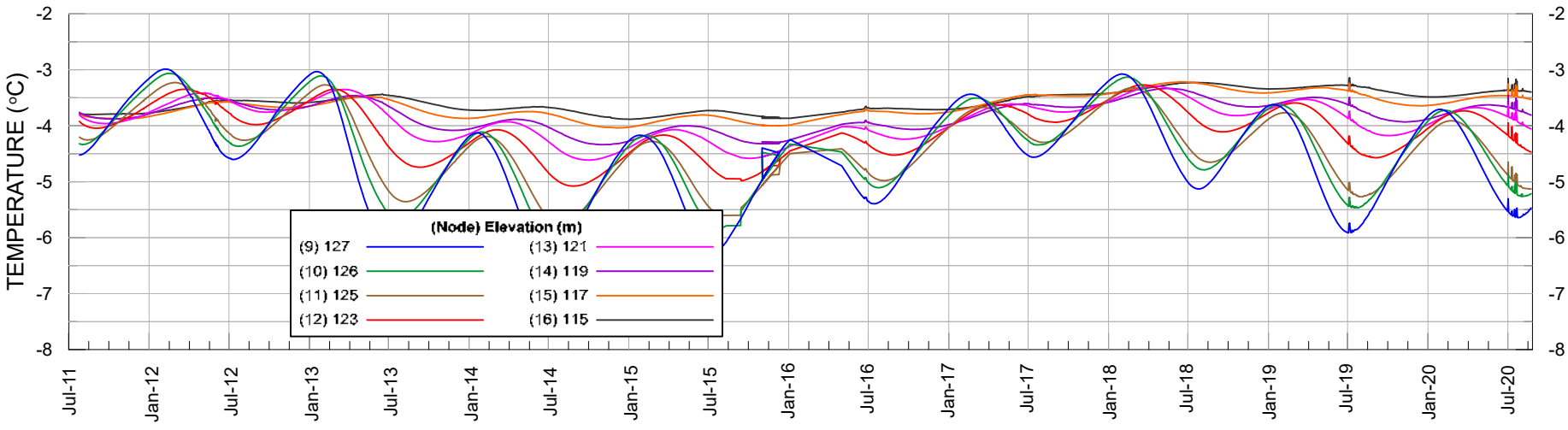
T29 (32+100) NODES 9 TO 16



T30 (32+140) NODES 1 TO 8



T30 (32+140) NODES 9 TO 16



Note:

PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE NODAL THERMAL TIMELINES (July 1/11 to Aug 27/20)

AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	17JAN14	SCALE AS SHOWN	REV.
CADD	TD	17JAN14	FIGURE 44	
CHECK				
REVIEW				

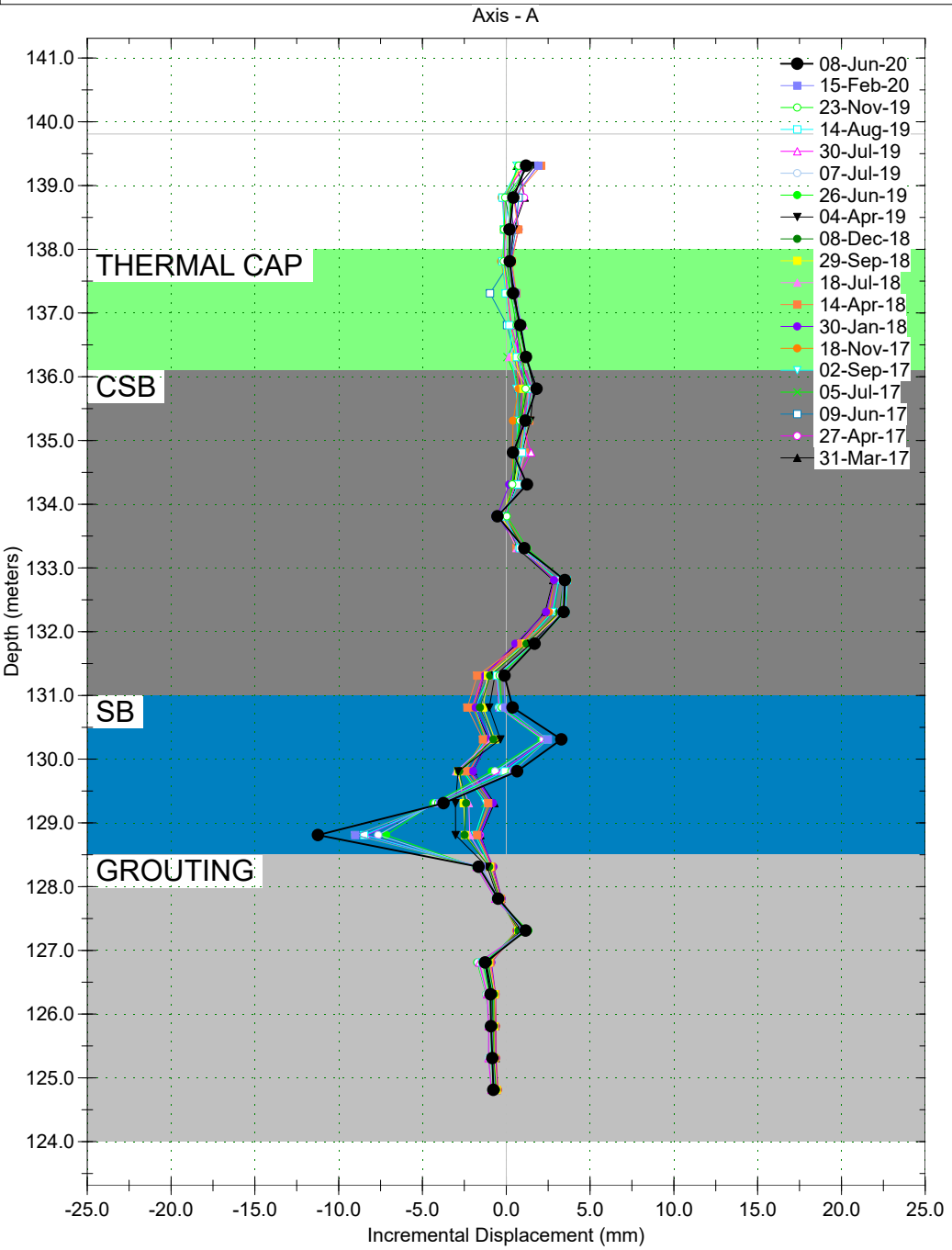
RST Instruments Ltd.

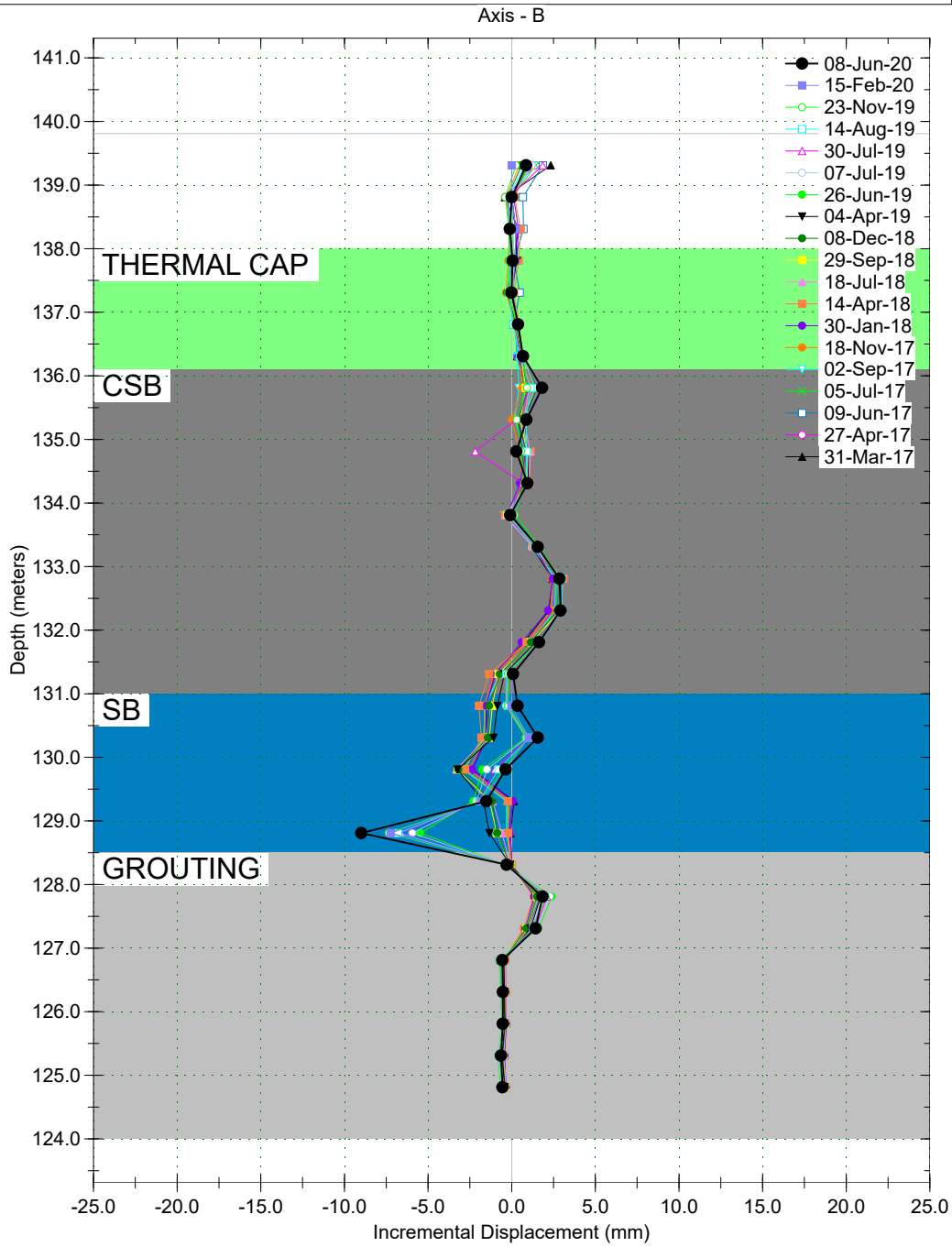
INCREMENTAL DISPLACEMENT

Inclinalysis v. 2.48.7

Borehole : BG-IN-30+282
Project : Inclinometers
Location : 30+282
Northing : 7212943.162
Easting : 639077.778
Collar : 139.814

Spiral Correction : N/A
Collar Elevation : :139.81 meters
Reading Depth : 15.0 meters
A+ Groove Azimuth :
Base Reading : 2011 Jul 24 07:18
Applied Azimuth : 0.0 degrees





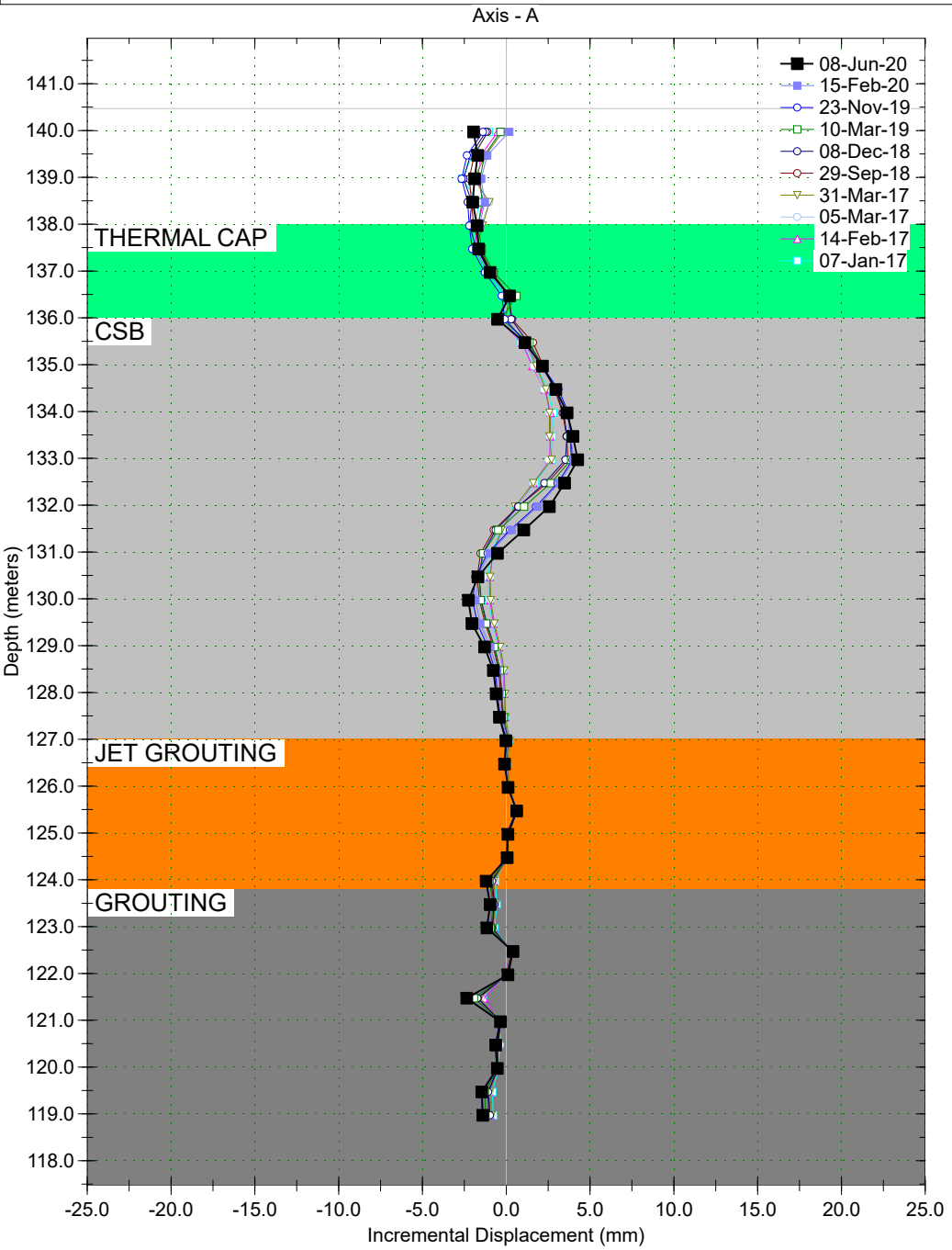
RST Instruments Ltd.

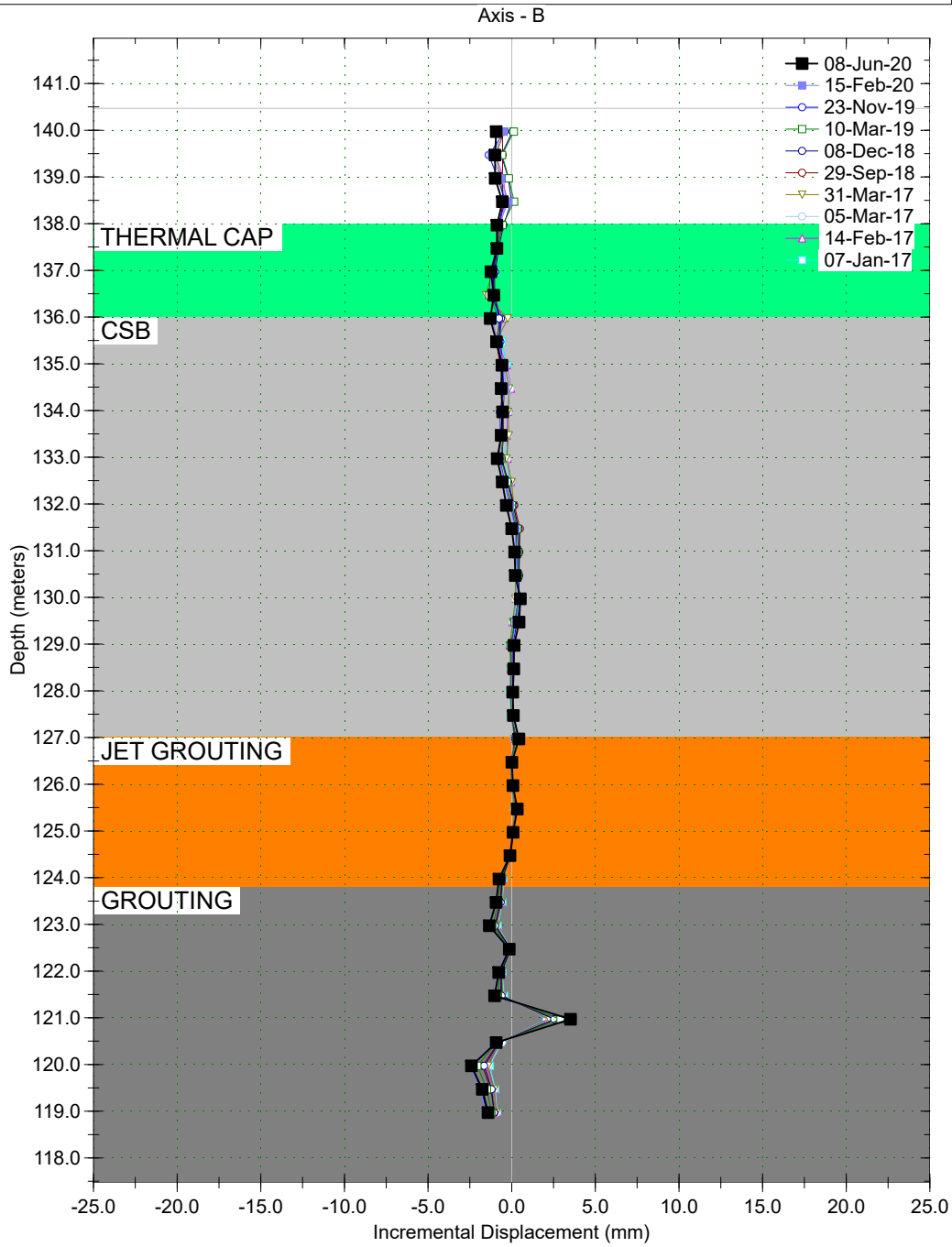
INCREMENTAL DISPLACEMENT

Inclinalysis v. 2.48.7

Borehole : BG-IN-30+390
Project : Inclinometers
Location : 30+390
Northing : 7212865.990
Easting : 639002.468
Collar : 140.472

Spiral Correction : N/A
Collar Elevation : :140.47 meters
Reading Depth : 21.5 meters
A+ Groove Azimuth :
Base Reading : 2011 Jul 24 06:54
Applied Azimuth : 0.0 degrees





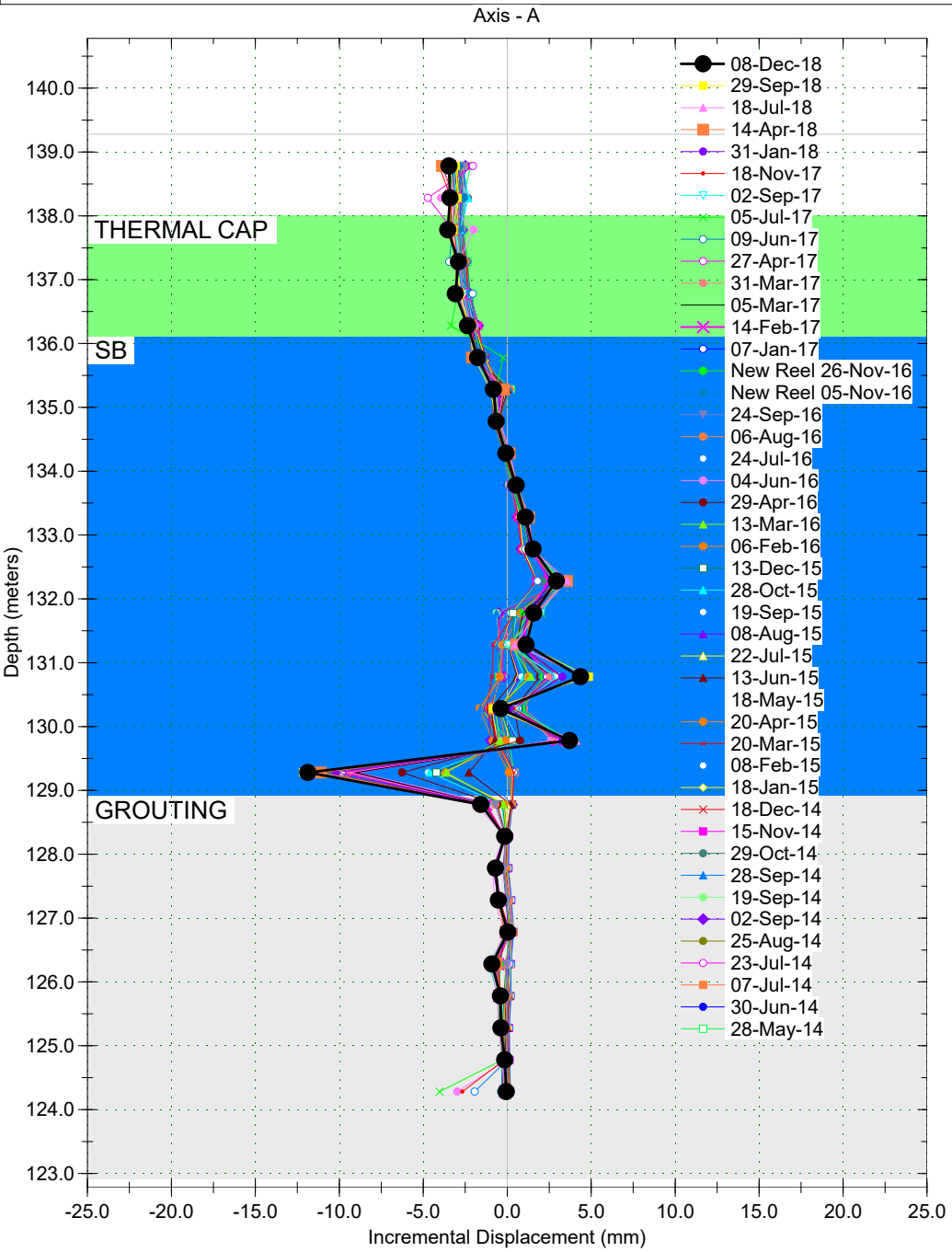
RST Instruments Ltd.

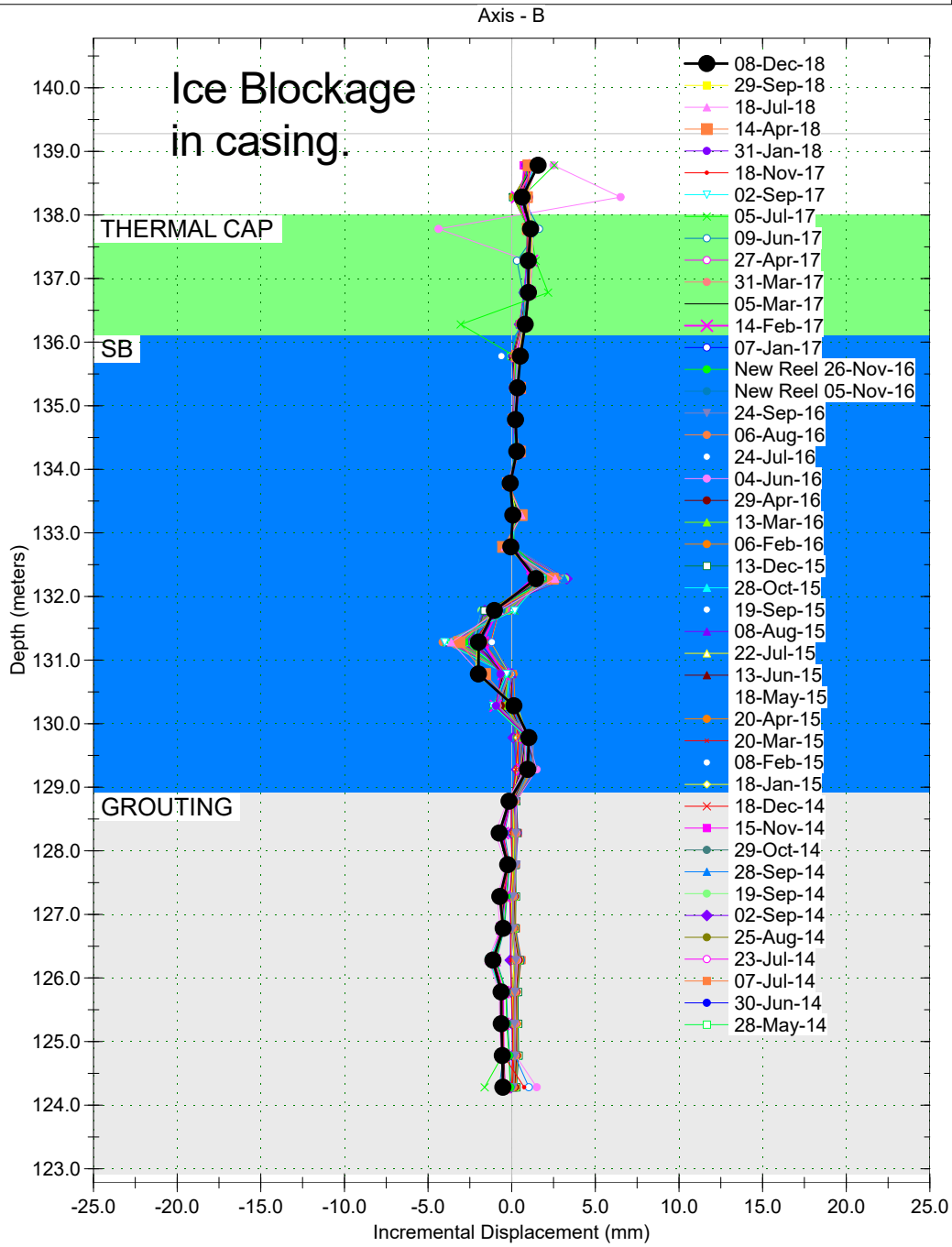
INCREMENTAL DISPLACEMENT

Inclinalysis v. 2.48.7

Borehole : BG-IN-30+640
Project : Inclinometers
Location : 30+640
Northing : 7212634.144
Easting : 638953.388
Collar : 139.275

Spiral Correction : N/A
Collar Elevation : :139.28 meters
Reading Depth : 15.0 meters
A+ Groove Azimuth :
Base Reading : 2011 Jul 23 16:17
Applied Azimuth : 0.0 degrees





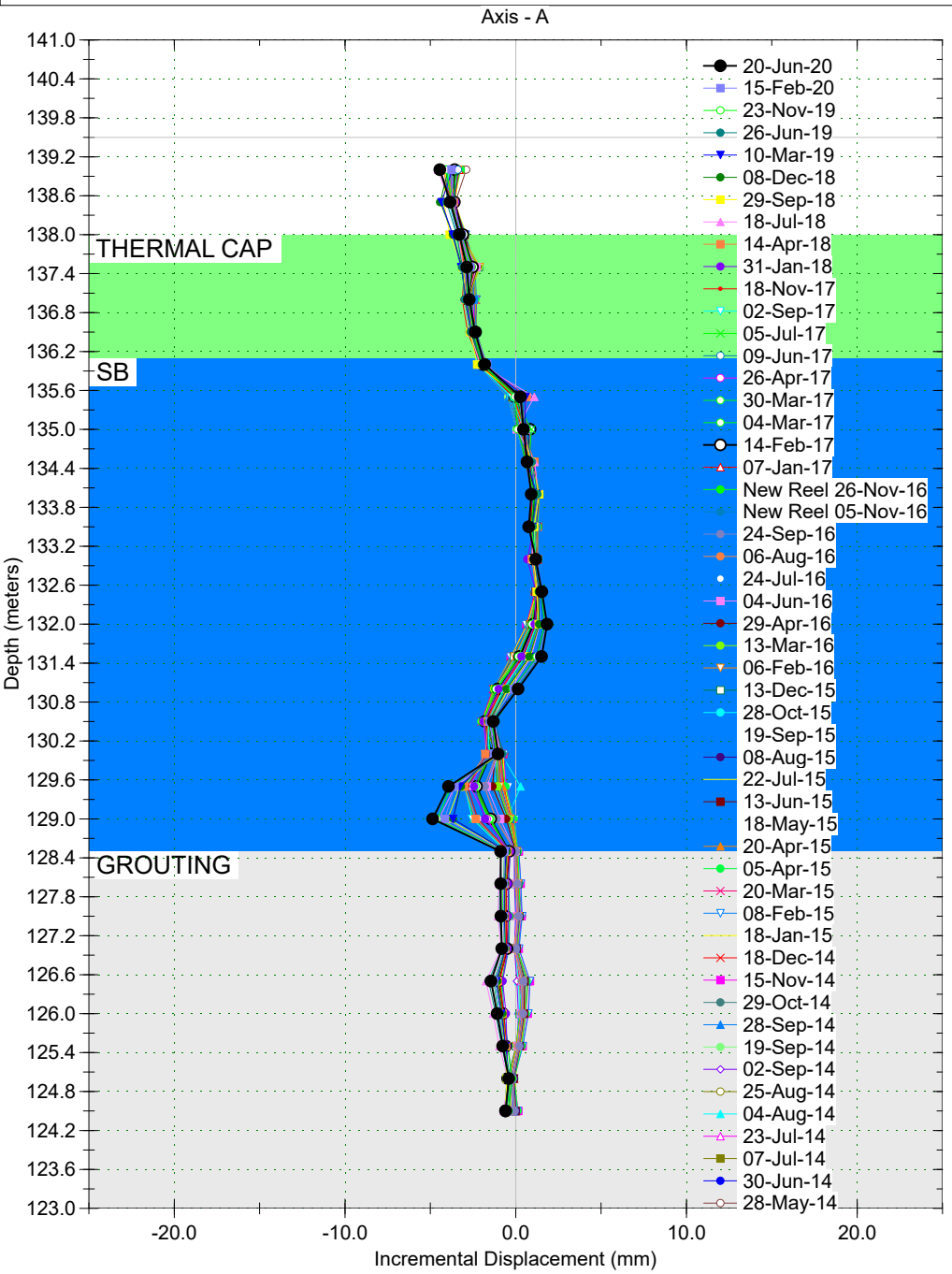
RST Instruments Ltd.

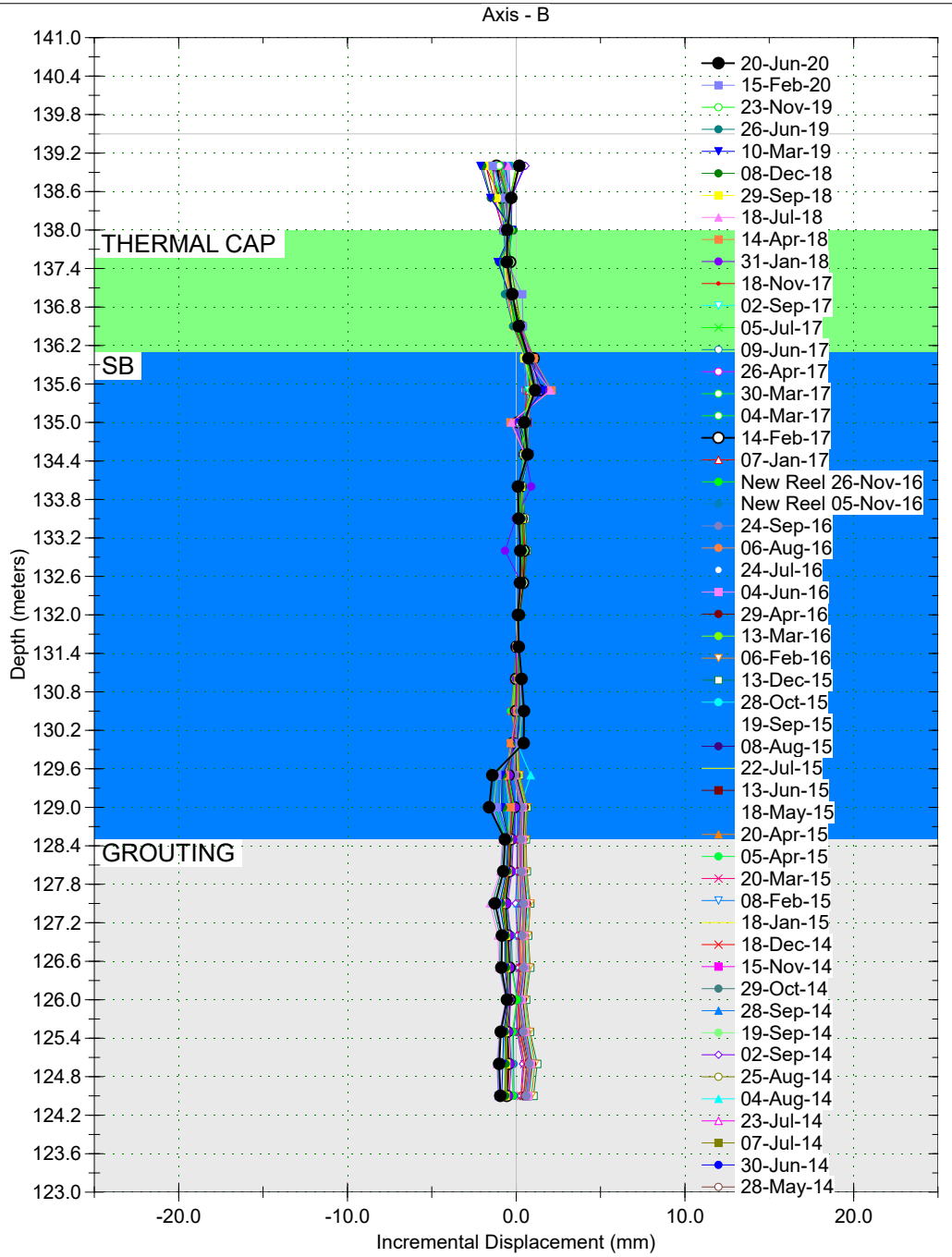
INCREMENTAL DISPLACEMENT

Inclinalysis v. 2.48.7

Borehole : BG-IN-31+180
Project : Inclinometers
Location : 31+180
Northing : 7212108.658
Easting : 638877.386
Collar : 139.525

Spiral Correction : N/A
Collar Elevation : :139.50 meters
Reading Depth : 15.0 meters
A+ Groove Azimuth :
Base Reading : 2011 Jul 23 15:42
Applied Azimuth : 0.0 degrees





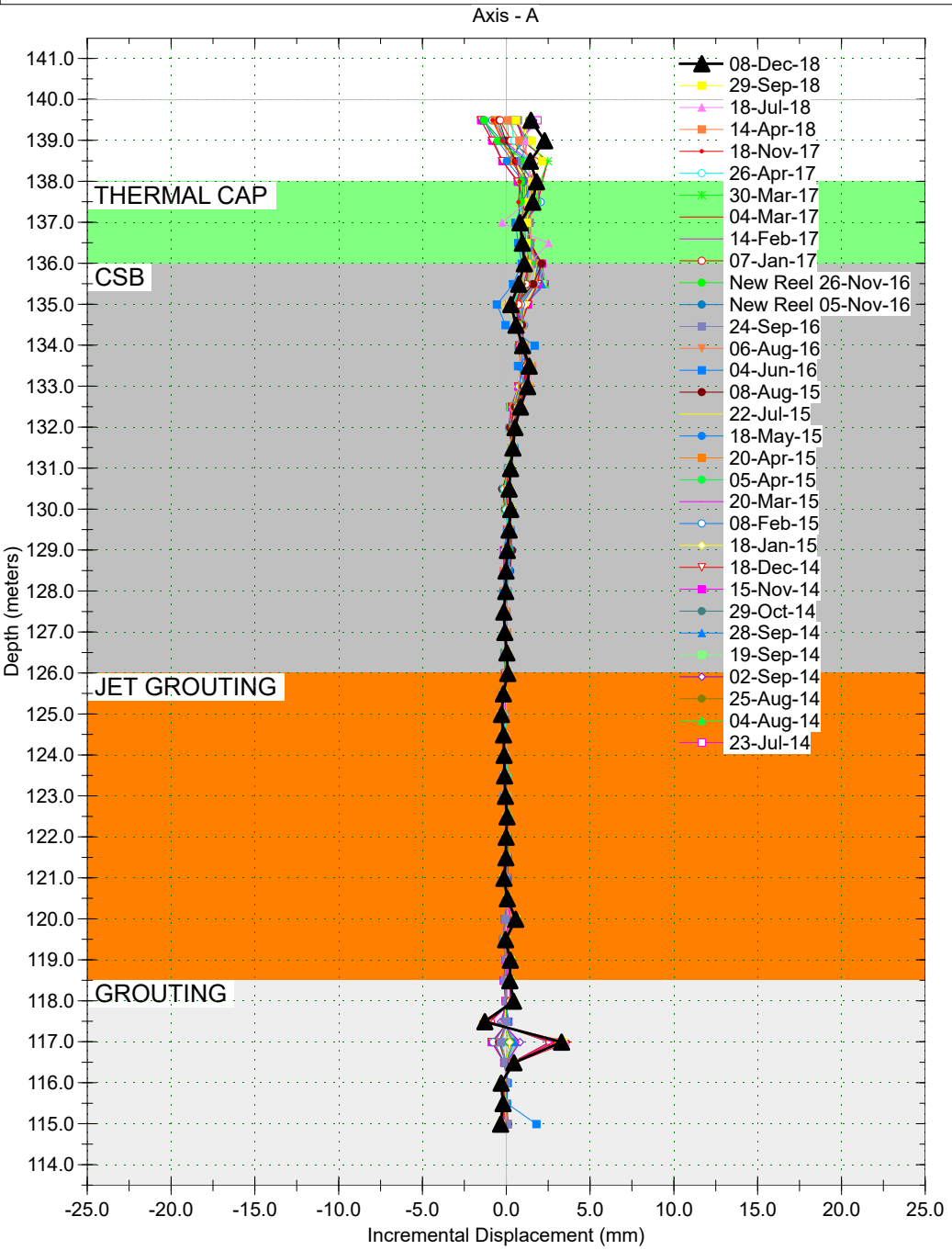
RST Instruments Ltd.

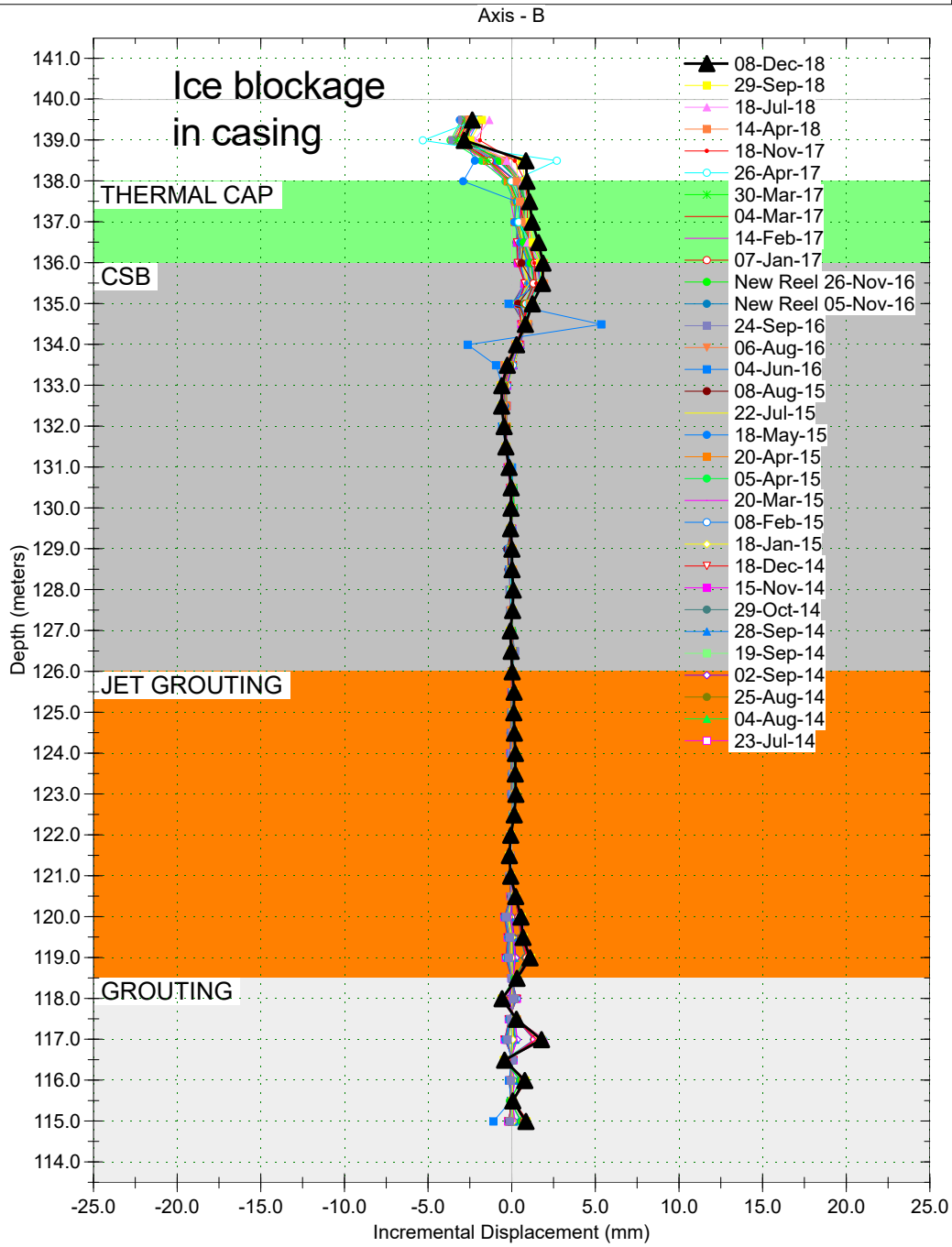
INCREMENTAL DISPLACEMENT

Inclinalysis v. 2.48.7

Borehole : BG-IN-31+590
Project : Inclinometers
Location : 31+590
Northing : 7211875.070
Easting : 638593.965
Collar : 139.988

Spiral Correction : N/A
Collar Elevation : :139.99 meters
Reading Depth : 25.0 meters
A+ Groove Azimuth :
Base Reading : 2011 Jul 23 10:17
Applied Azimuth : 0.0 degrees





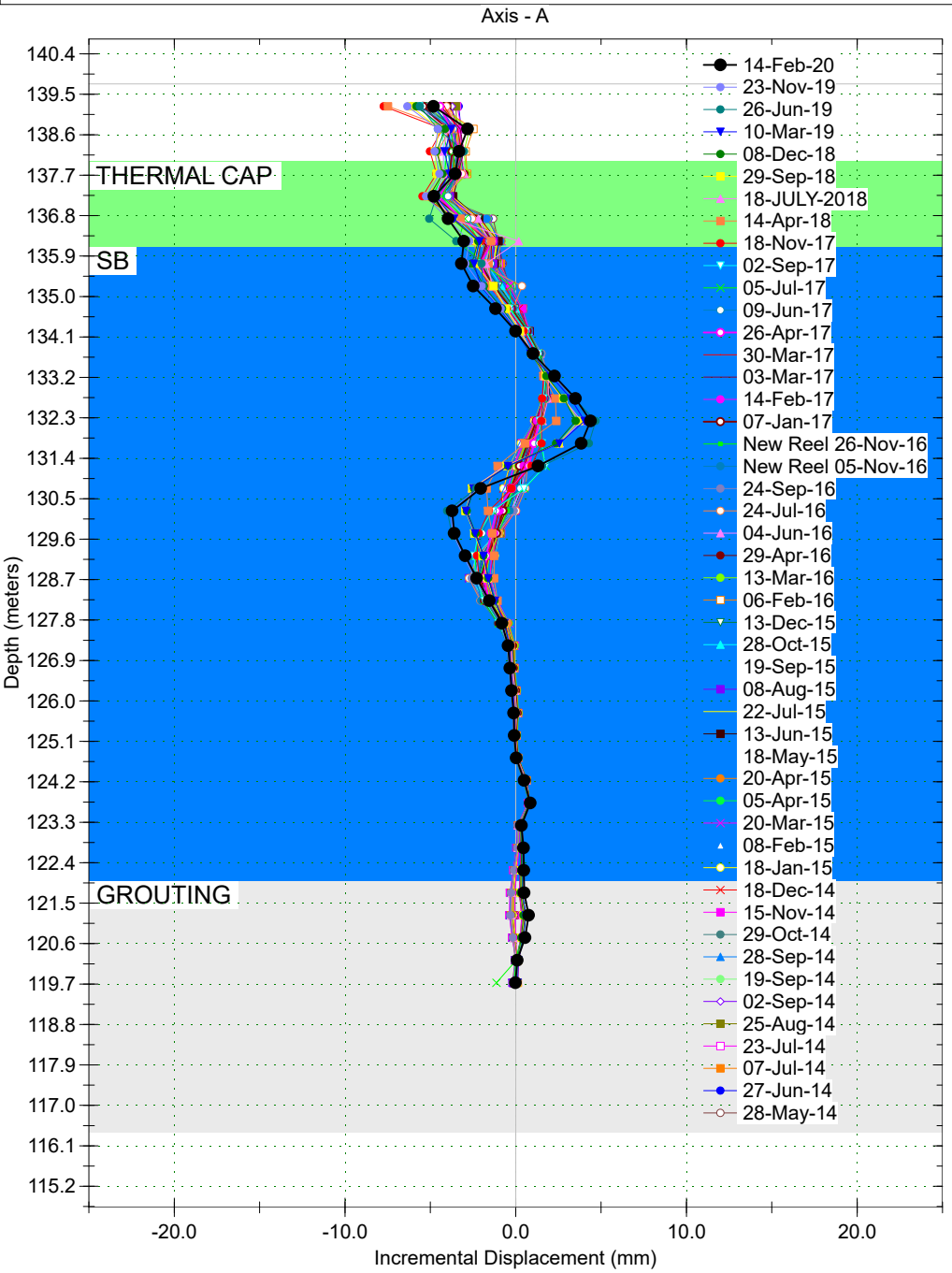
RST Instruments Ltd.

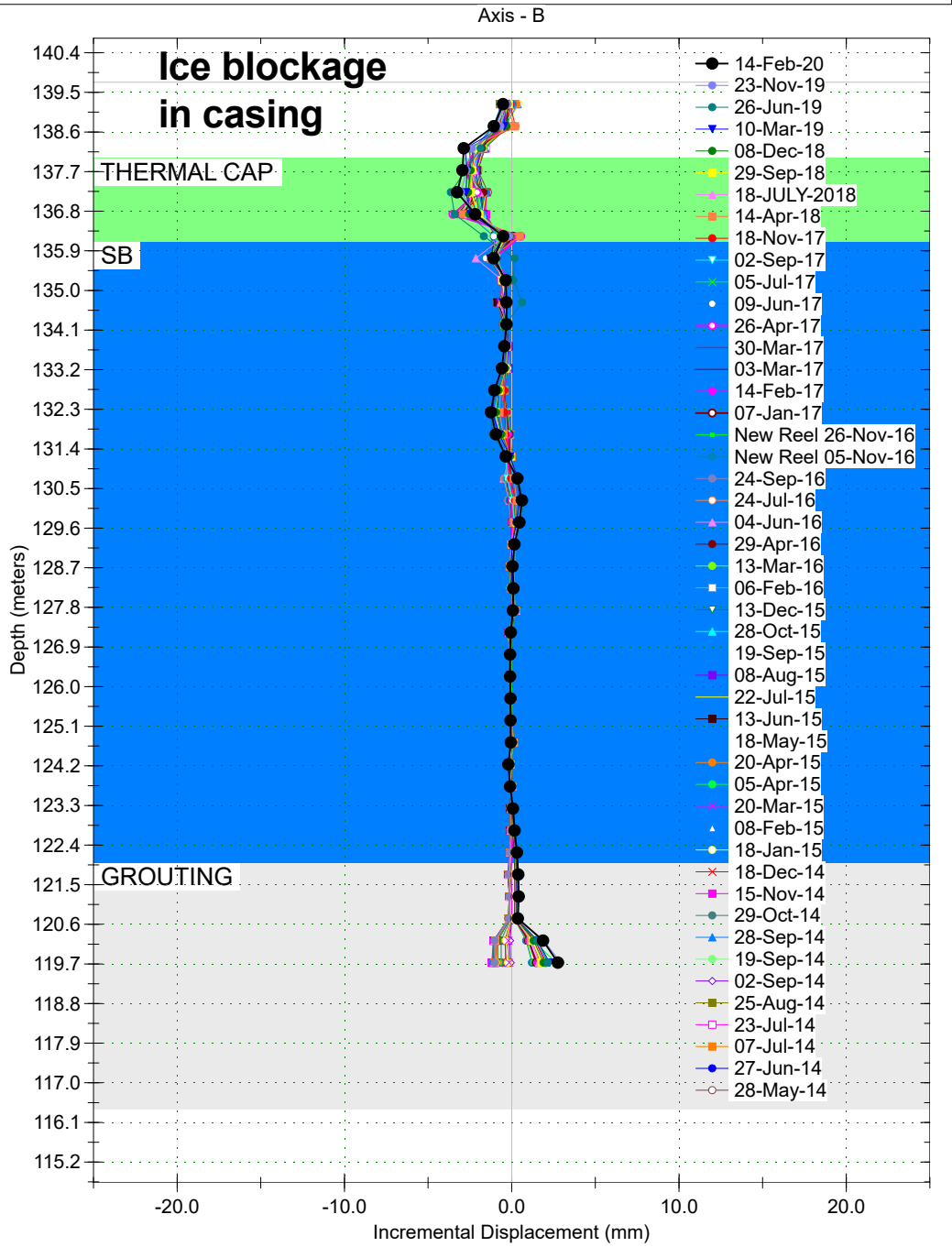
INCREMENTAL DISPLACEMENT

Inclinalysis v. 2.48.7

Borehole : BG-IN-31+815
Project : Inclinometers
Location : 31+815
Northing : 7212031.135
Easting : 638475.717
Collar : 139.731

Spiral Correction : N/A
Collar Elevation : :139.73 meters
Reading Depth : 20.0 meters
A+ Groove Azimuth :
Base Reading : 2011 Jul 23 09:40
Applied Azimuth : 0.0 degrees





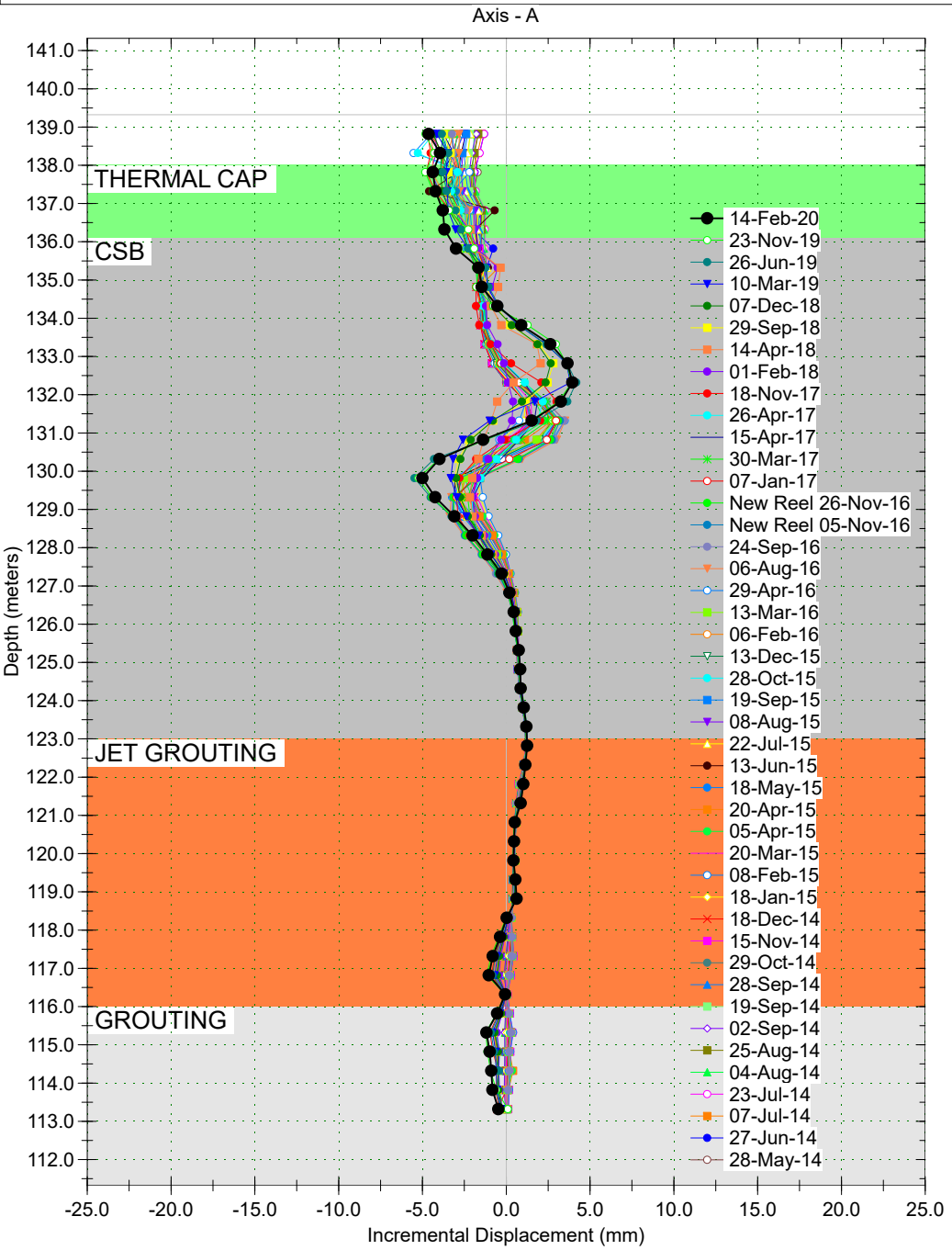
RST Instruments Ltd.

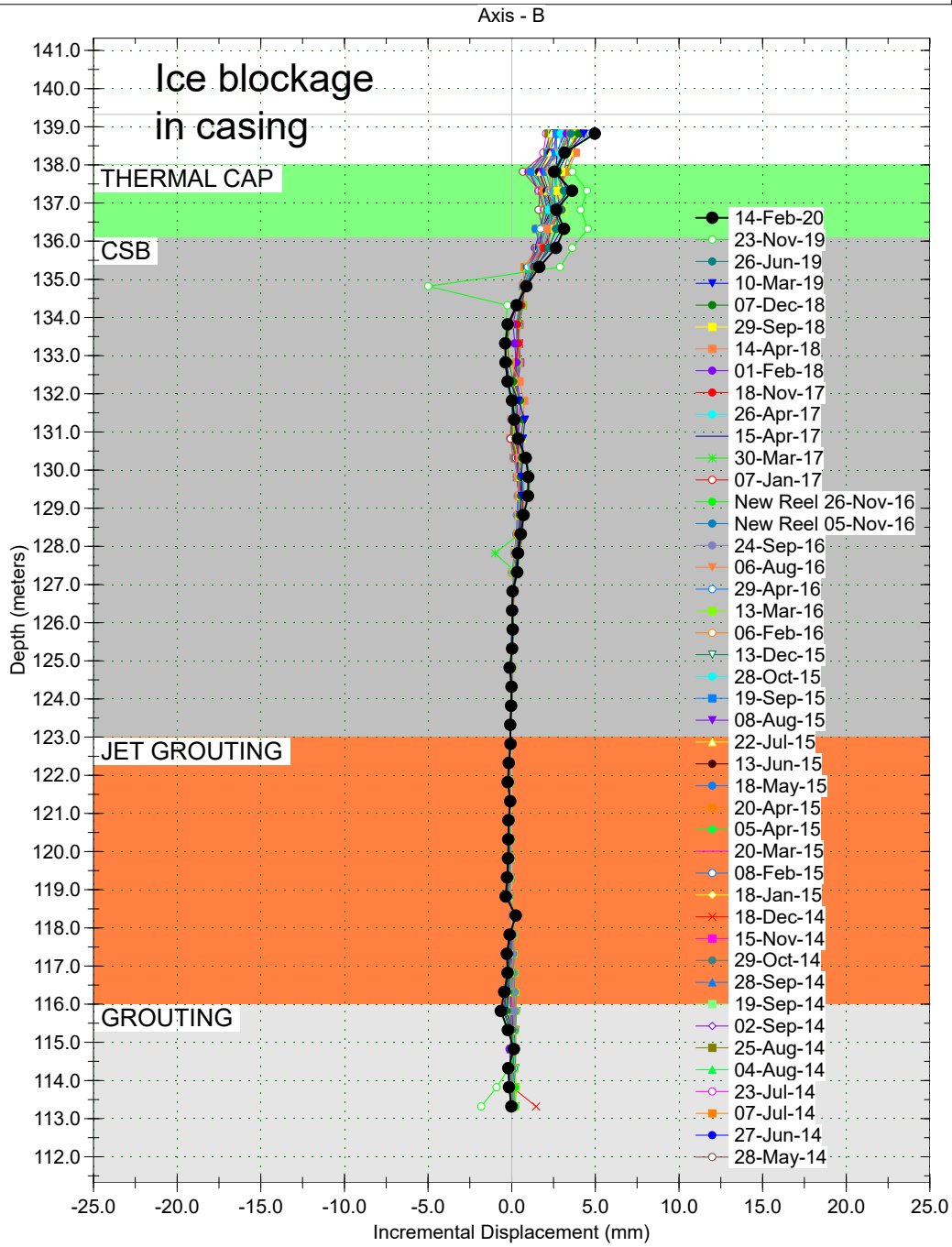
INCREMENTAL DISPLACEMENT

Inclinalysis v. 2.48.7

Borehole : BG-IN-31+885
Project : Inclinometers
Location : 31+885
Northing : 7212085.062
Easting : 638439.68
Collar : 139.317

Spiral Correction : N/A
Collar Elevation : :139.32 meters
Reading Depth : 26.0 meters
A+ Groove Azimuth :
Base Reading : 2011 Jul 23 09:00
Applied Azimuth : 0.0 degrees





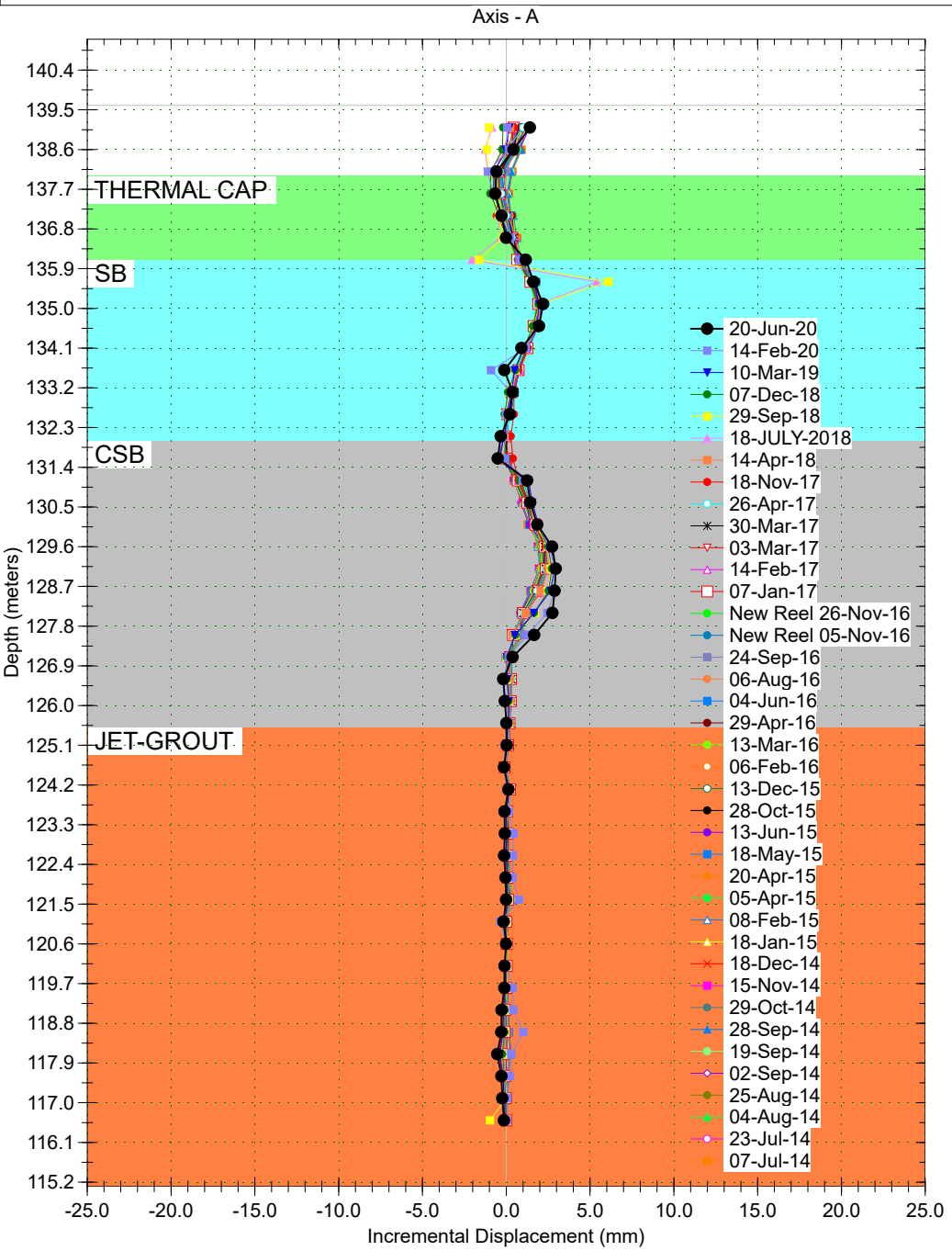
RST Instruments Ltd.

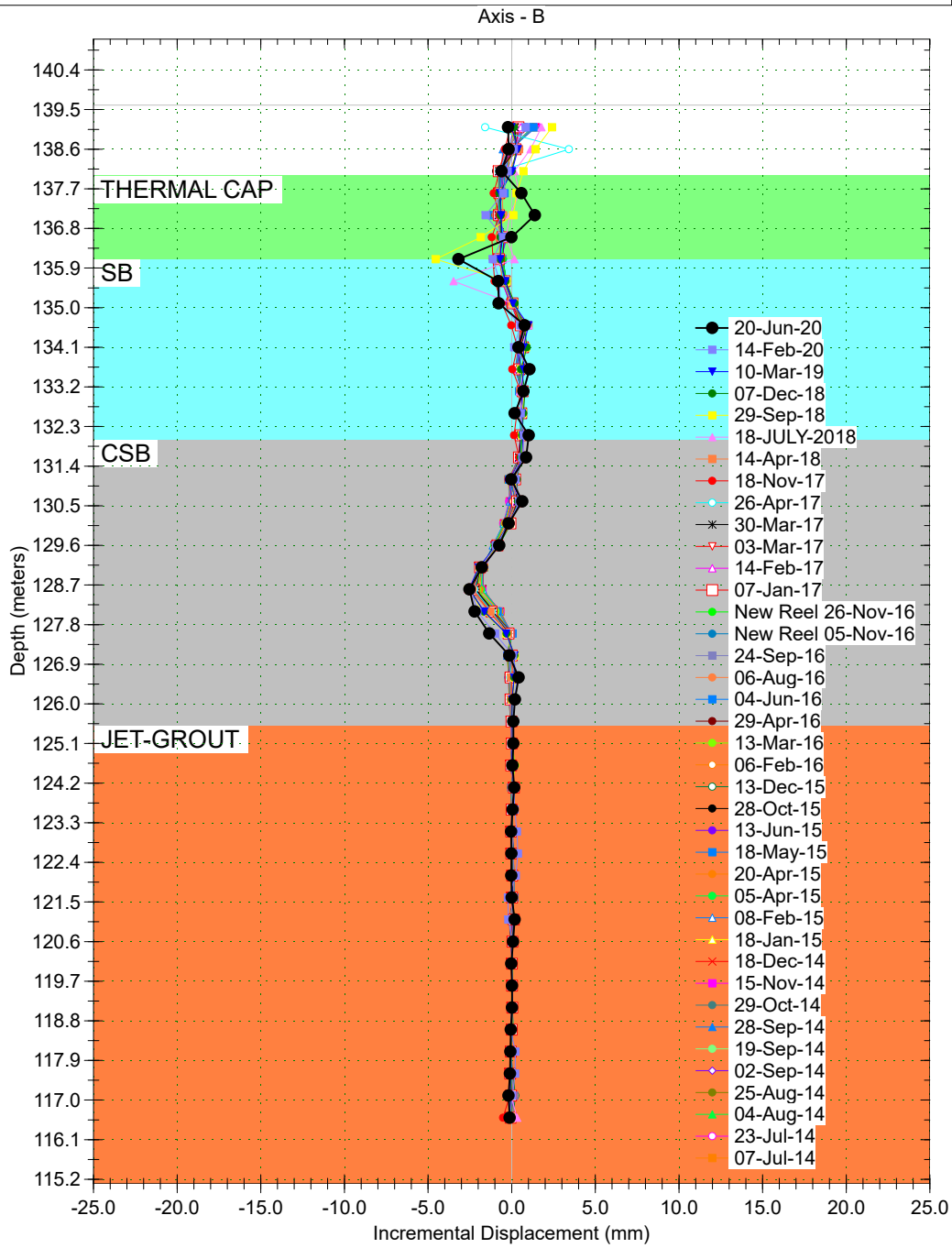
INCREMENTAL DISPLACEMENT

Inclinalysis v. 2.48.7

Borehole : BG-IN-32+065
Project : Inclinometers
Location : 32+065
Northing : 7212221.646
Easting : 638332.493
Collar : 139.598

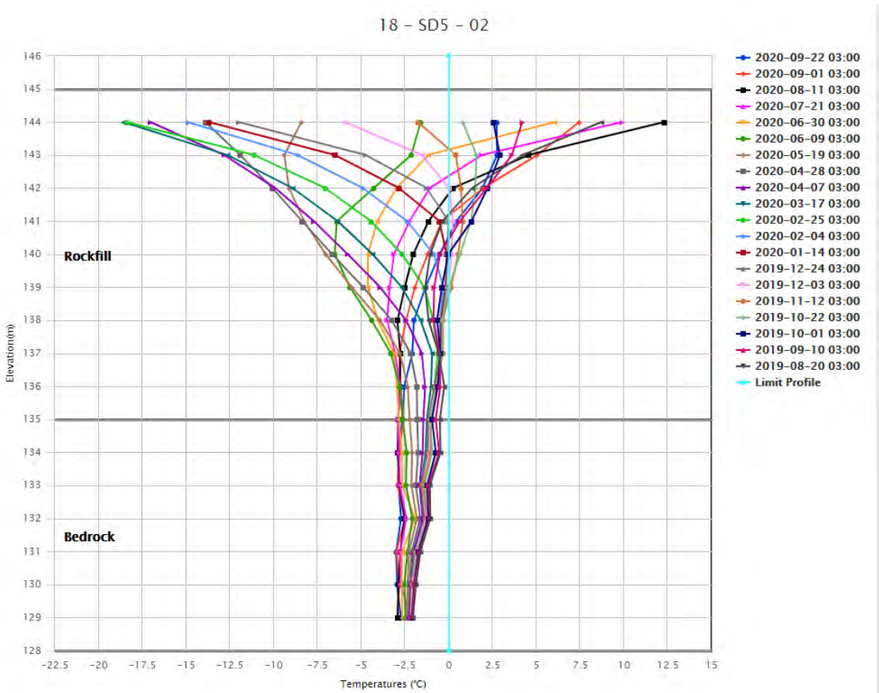
Spiral Correction : N/A
Collar Elevation : :139.60 meters
Reading Depth : 23.0 meters
A+ Groove Azimuth :
Base Reading : 2011 Jul 23 08:10
Applied Azimuth : 0.0 degrees

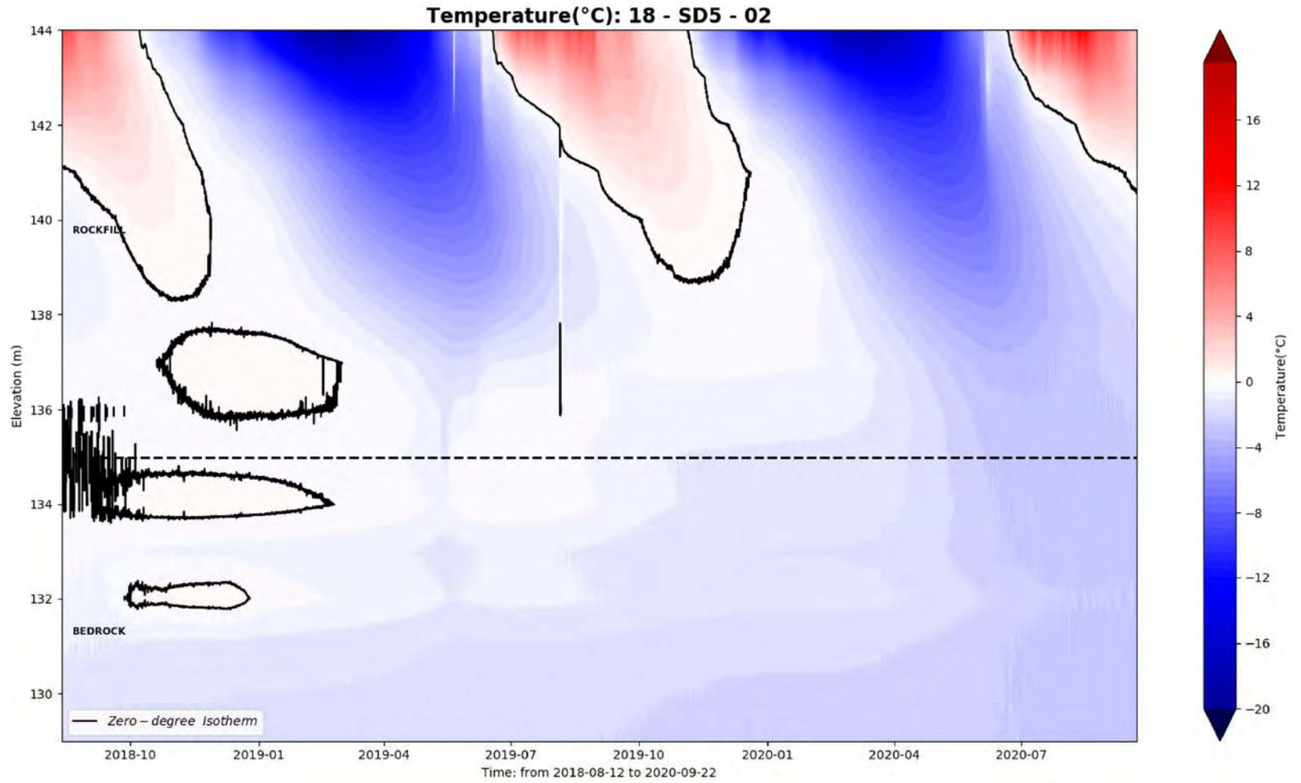


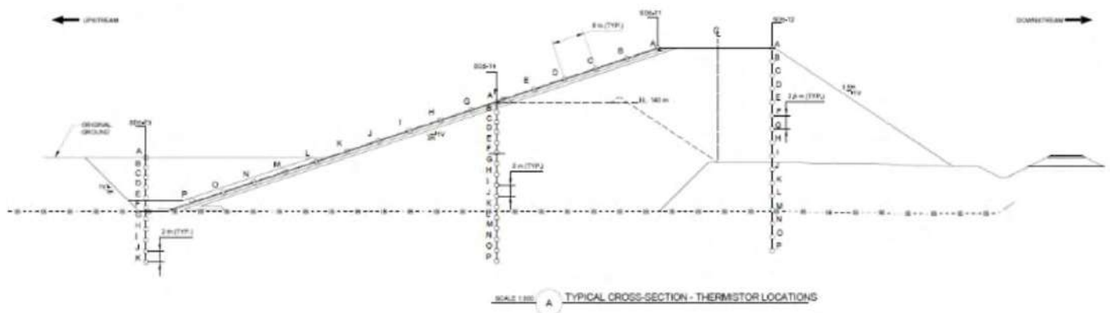


Saddle Dam 5 – T2



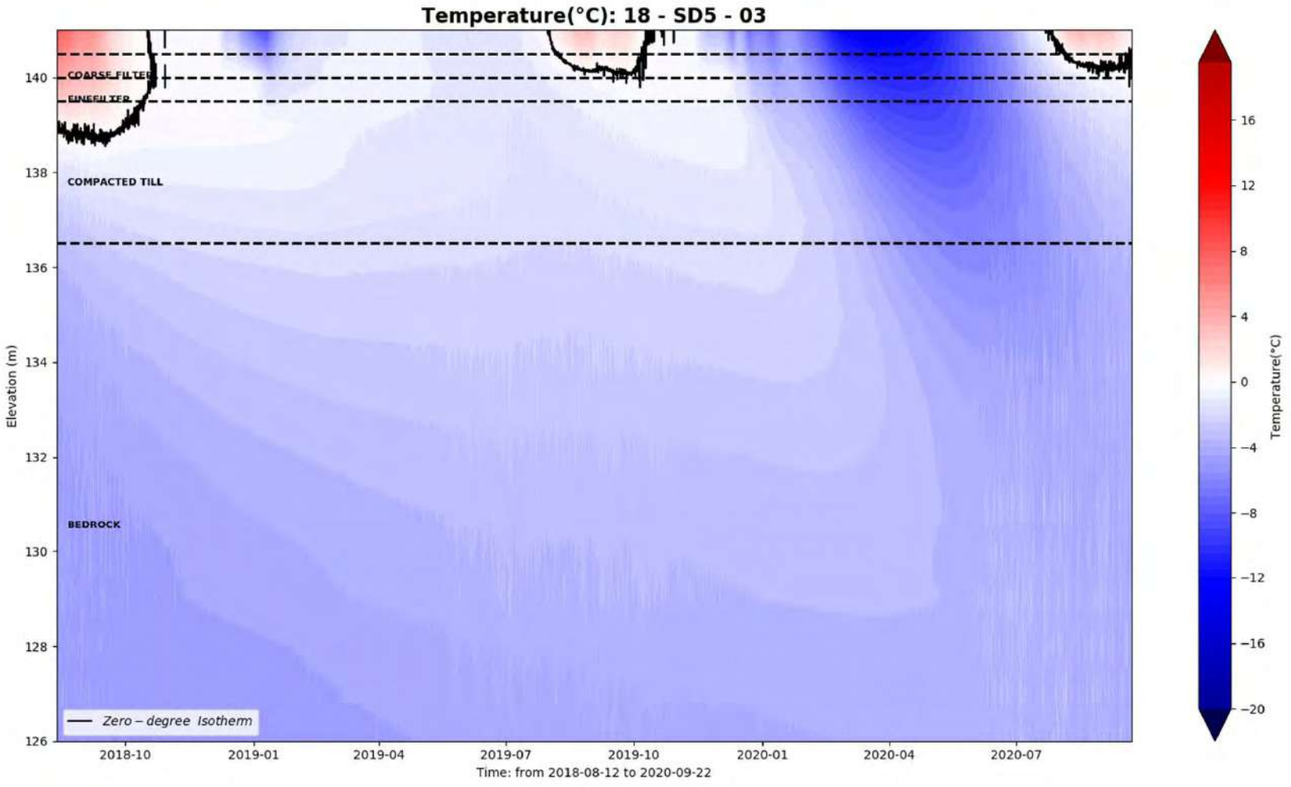


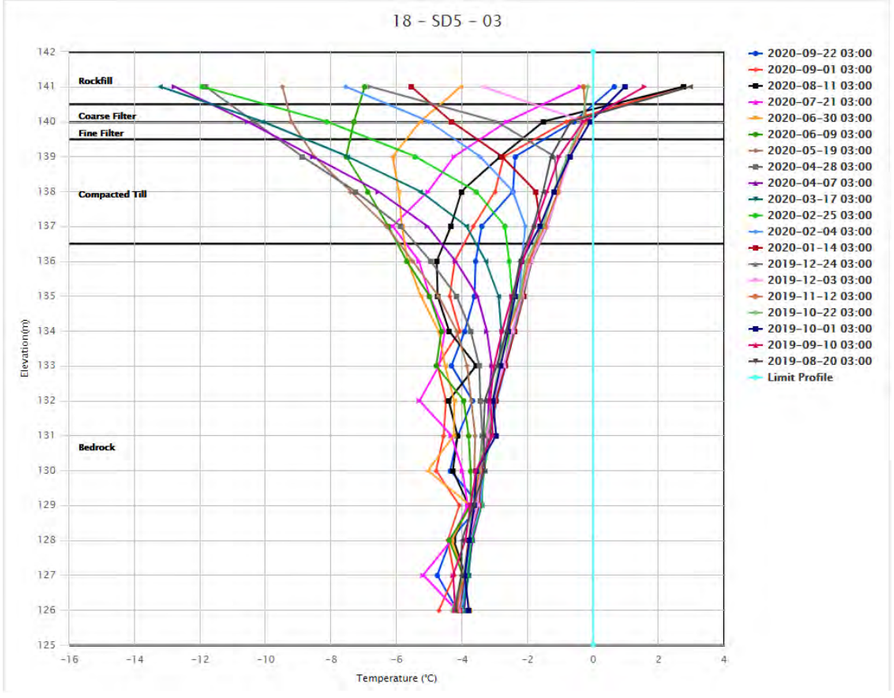


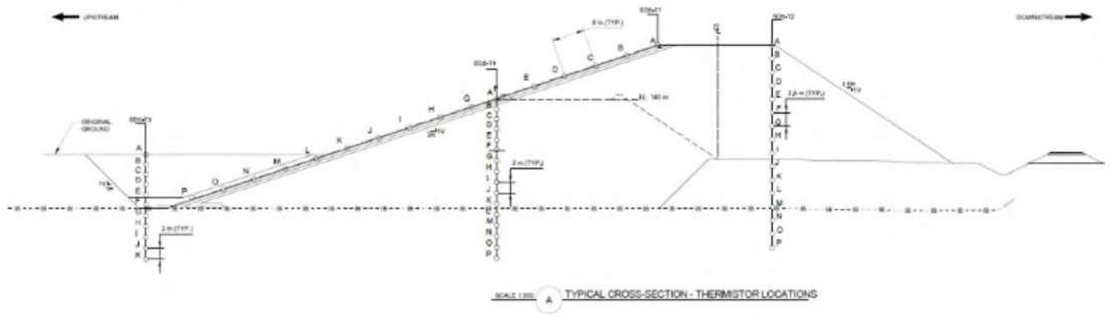


Saddle Dam 5 – T3



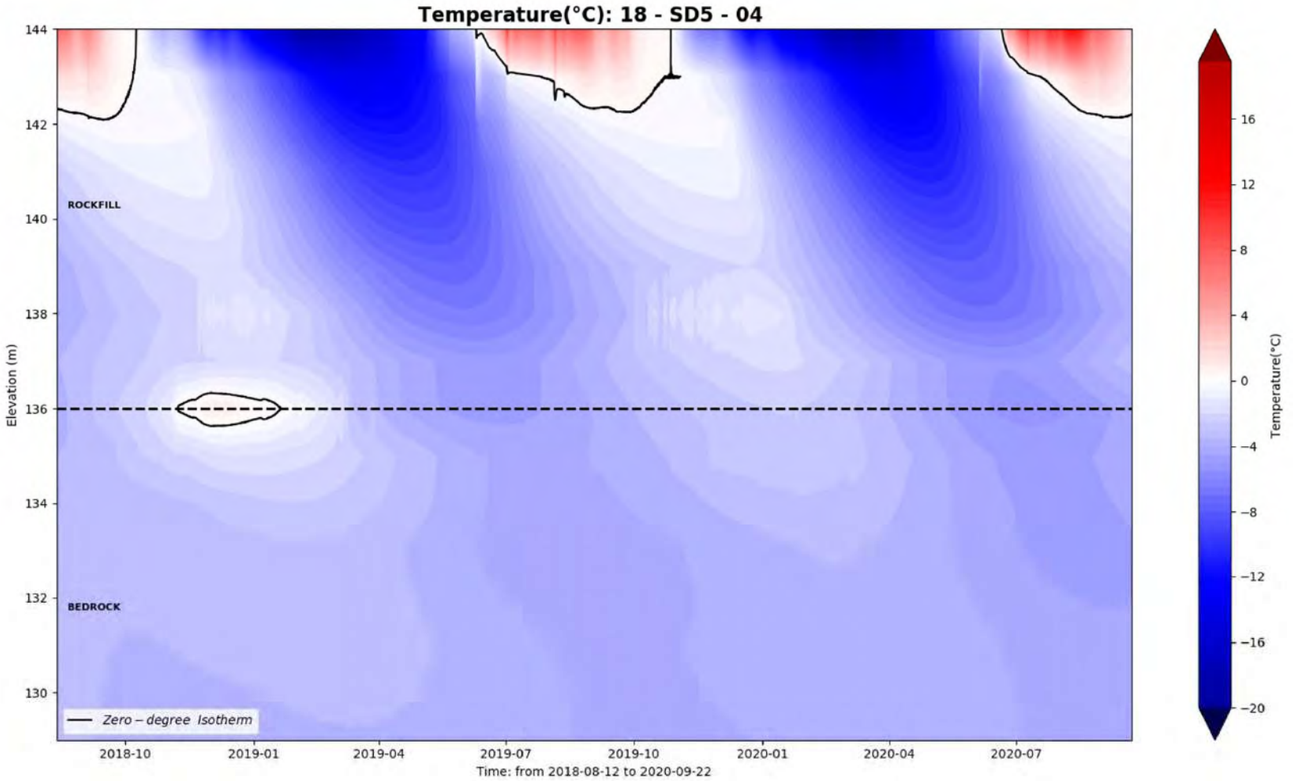


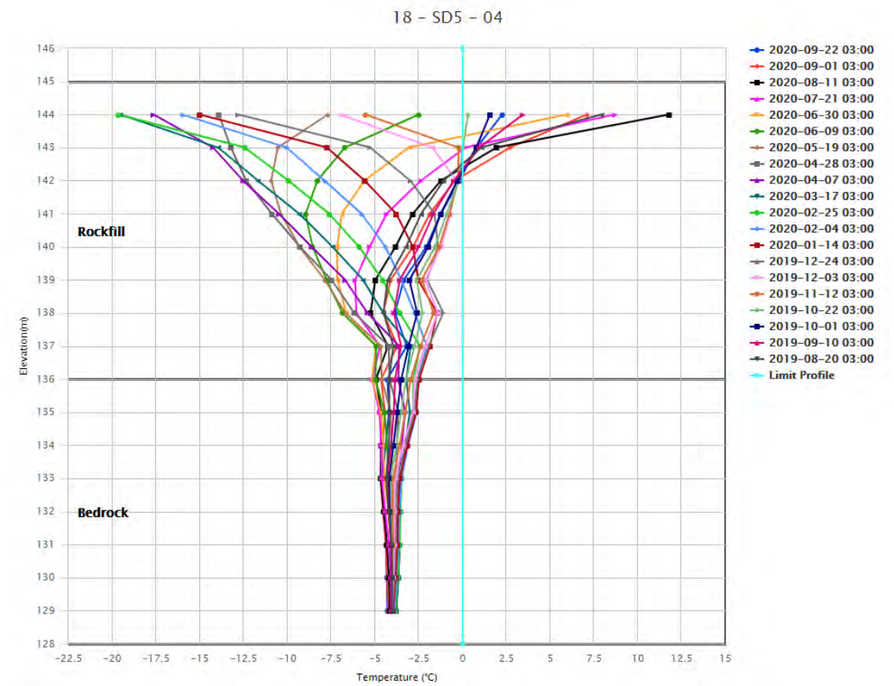


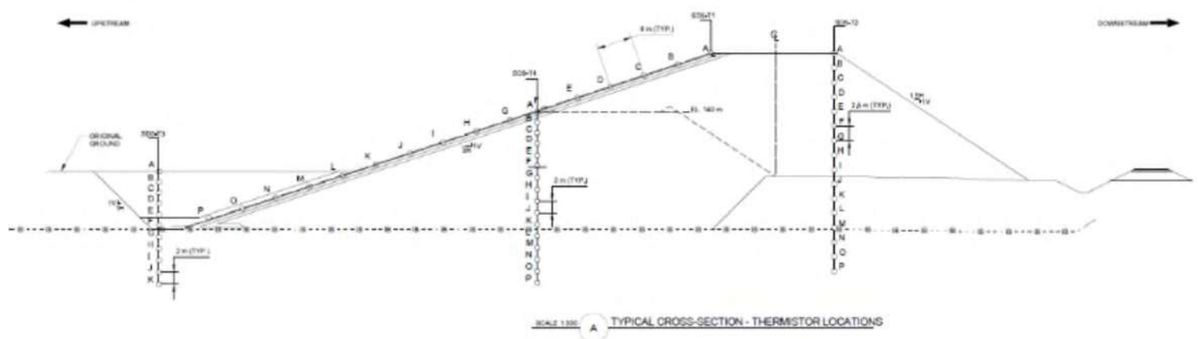


Saddle Dam 5 – T4



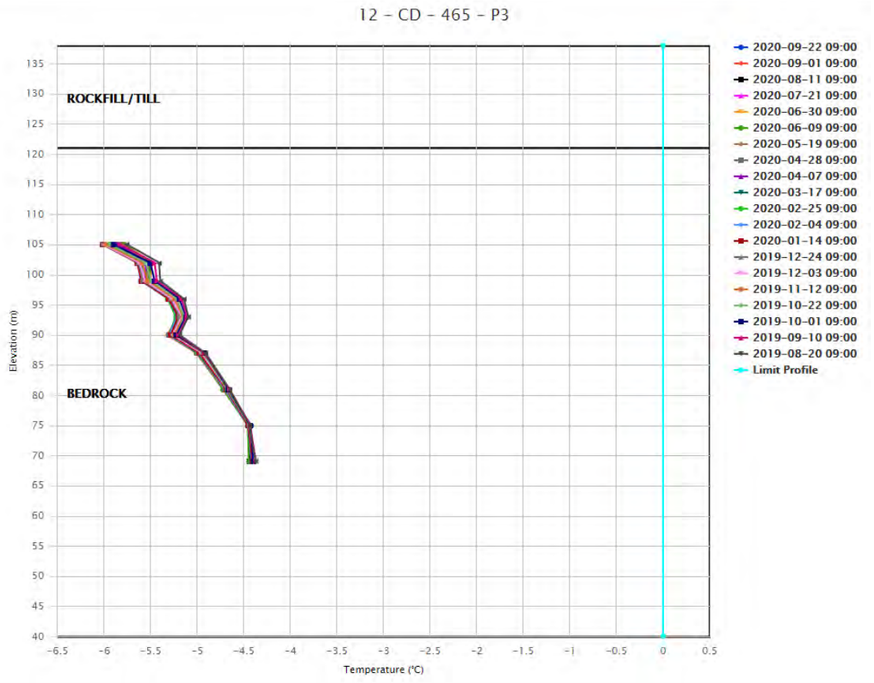


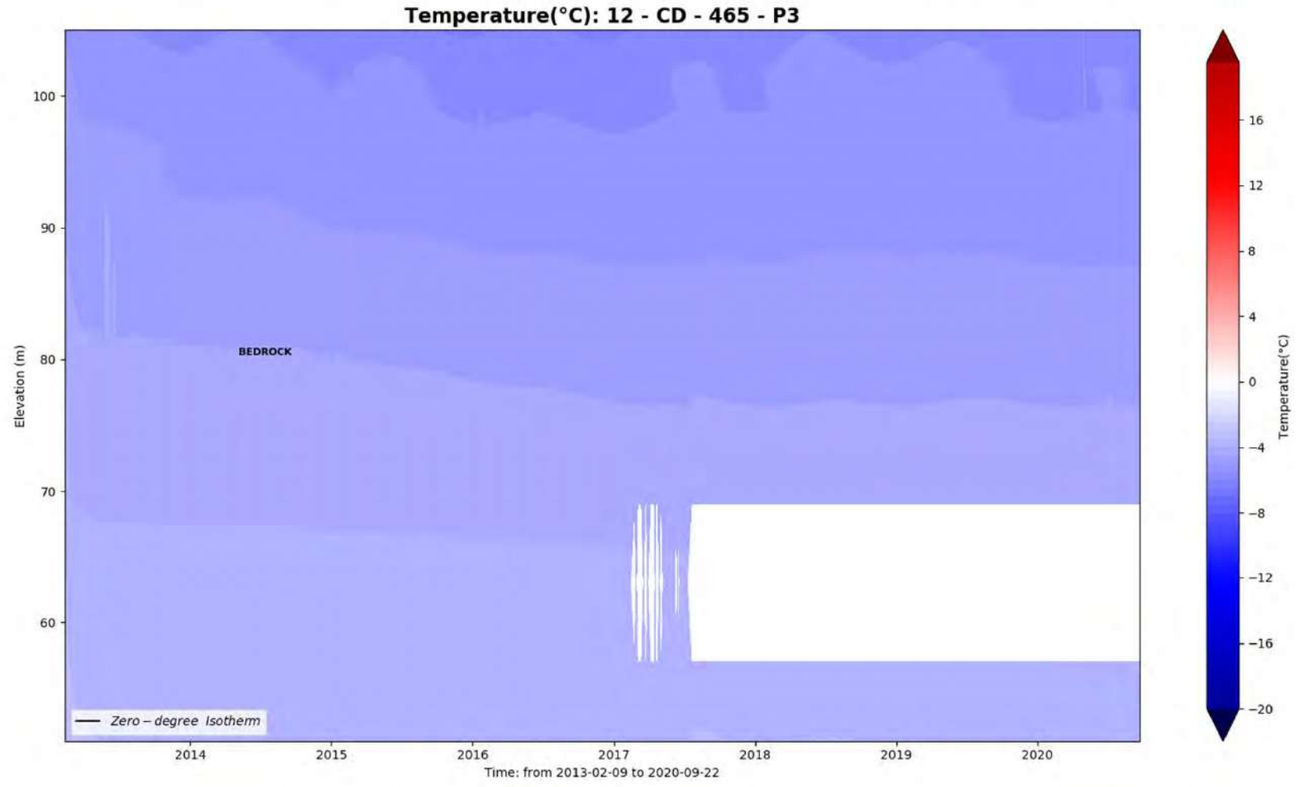


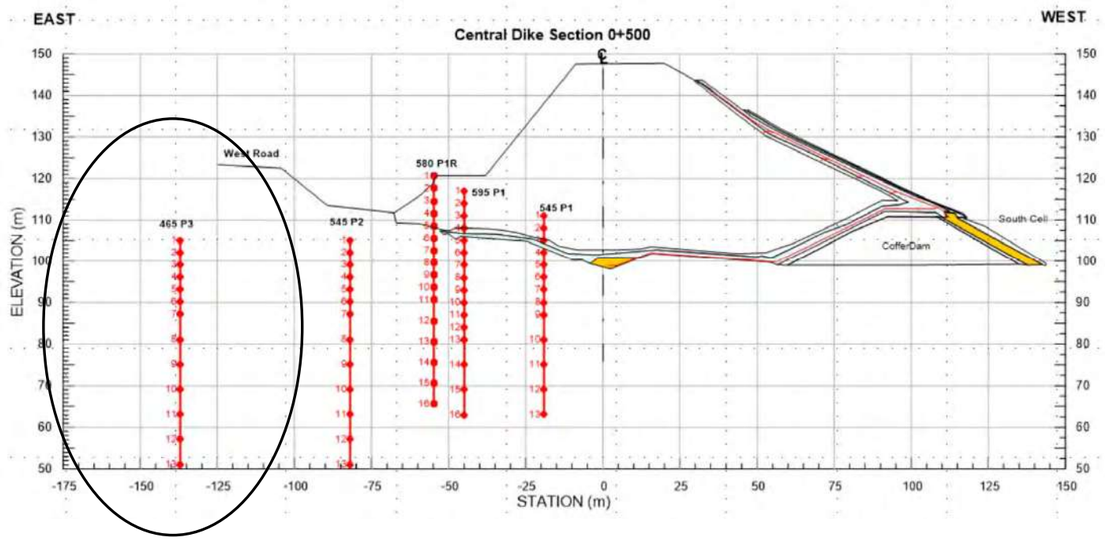


Central Dike – 465 P3



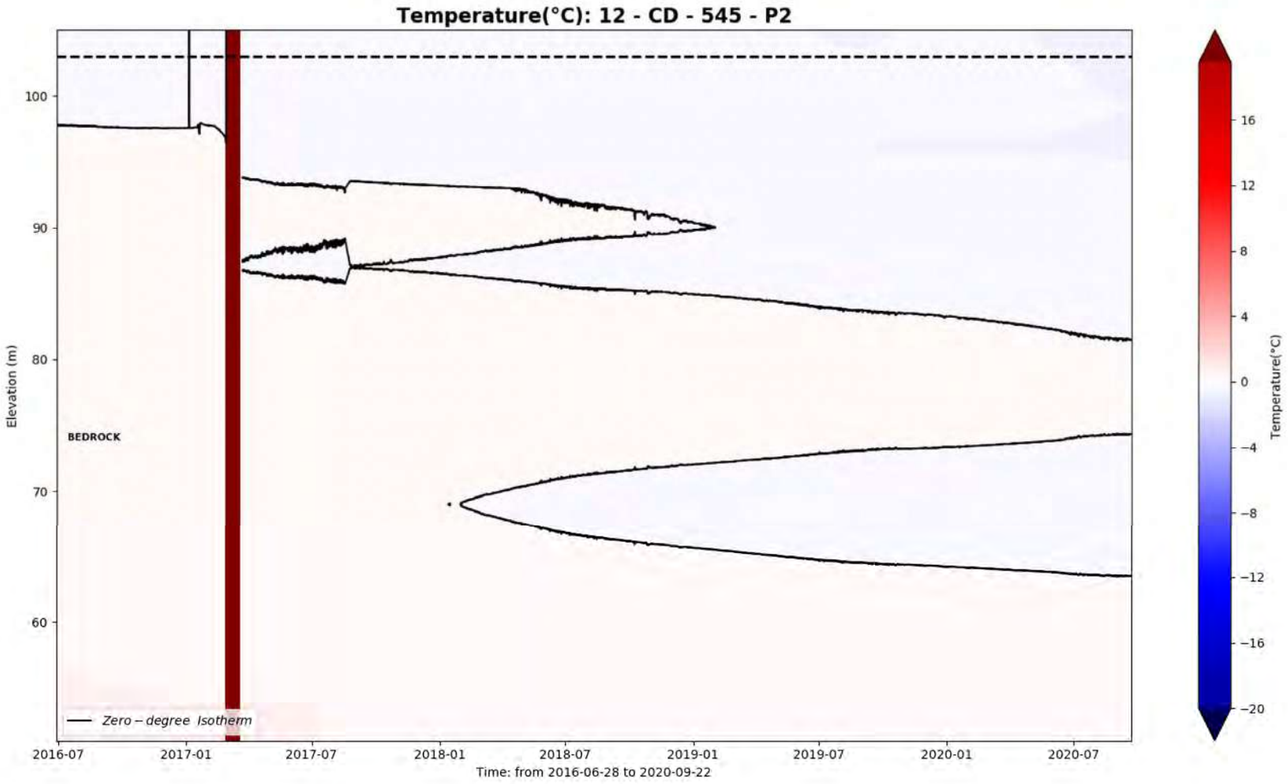


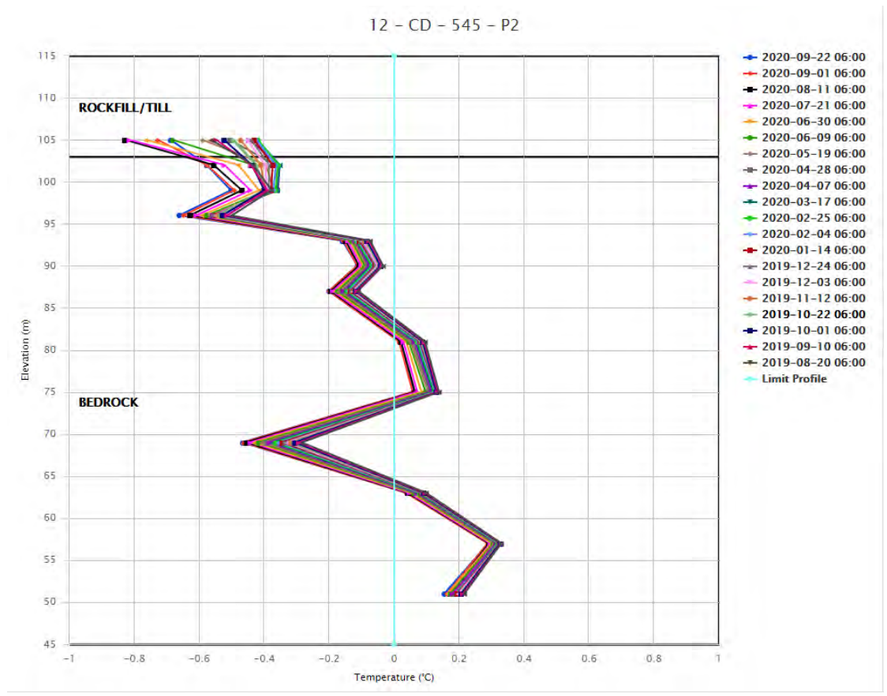


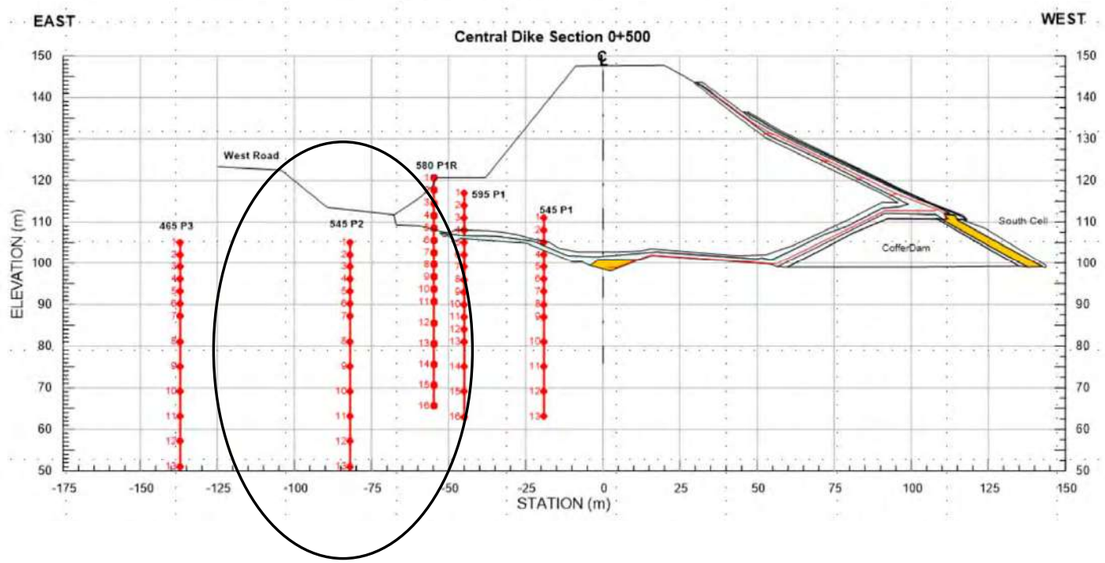


Central Dike – 545 P2



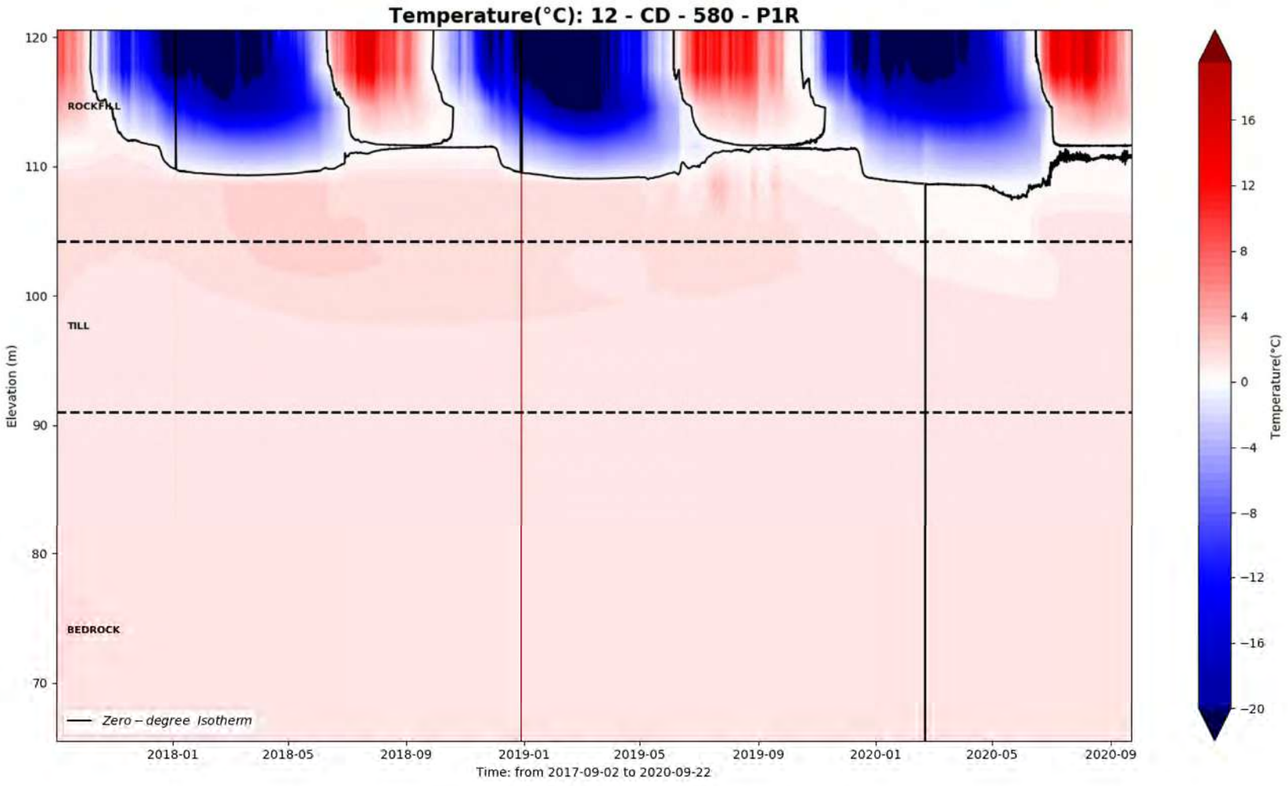


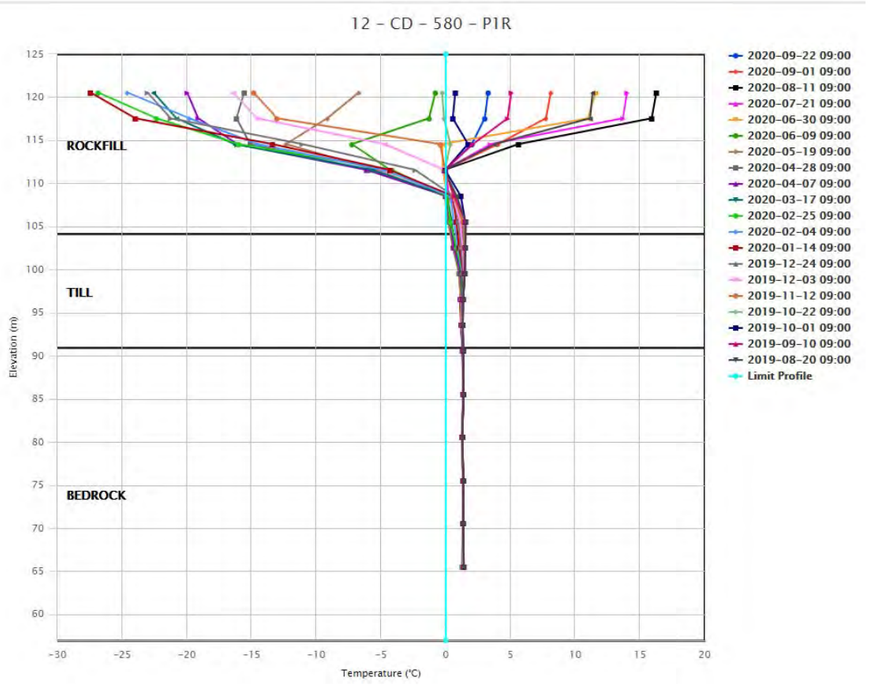


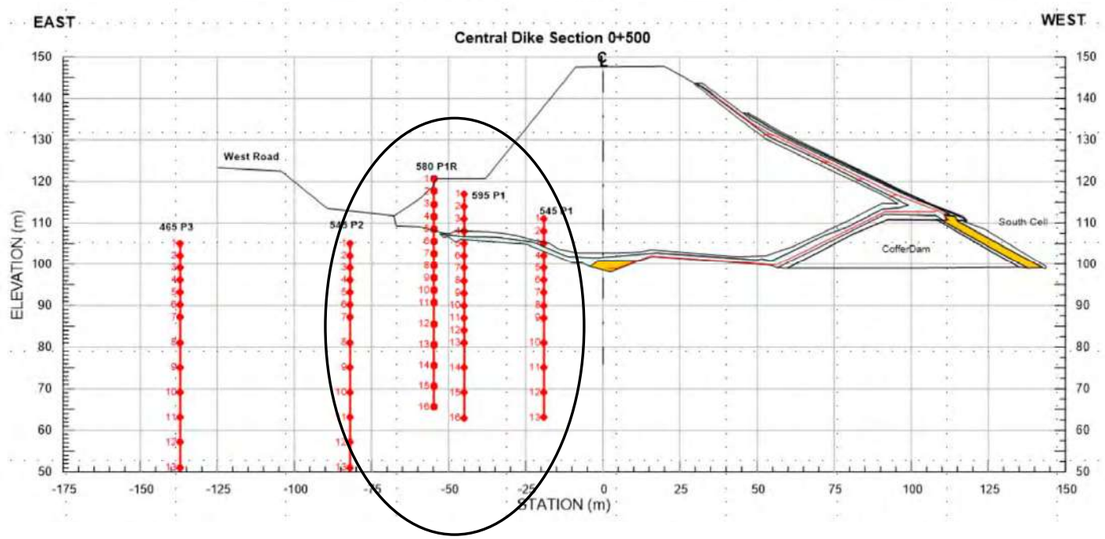


Central Dike – 580 P1 R



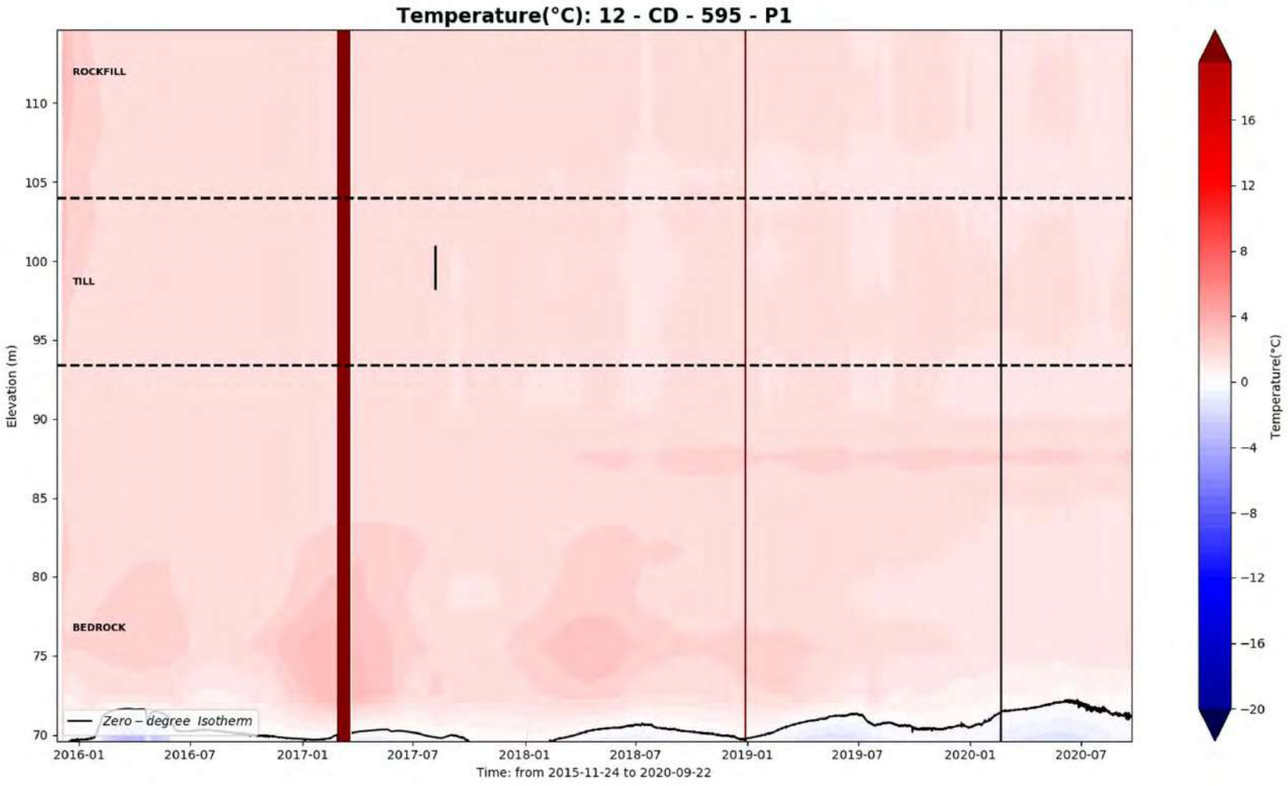


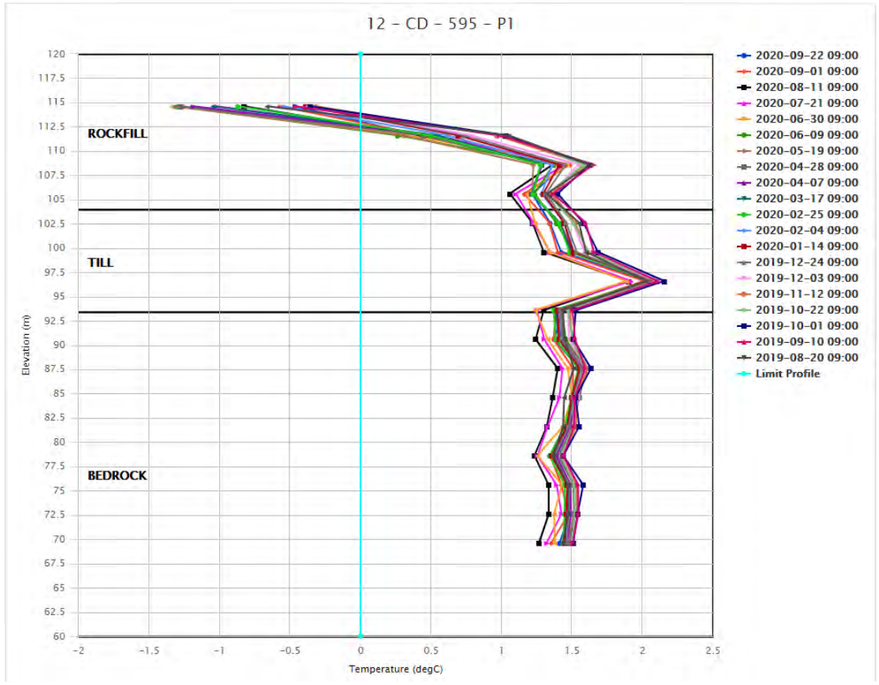


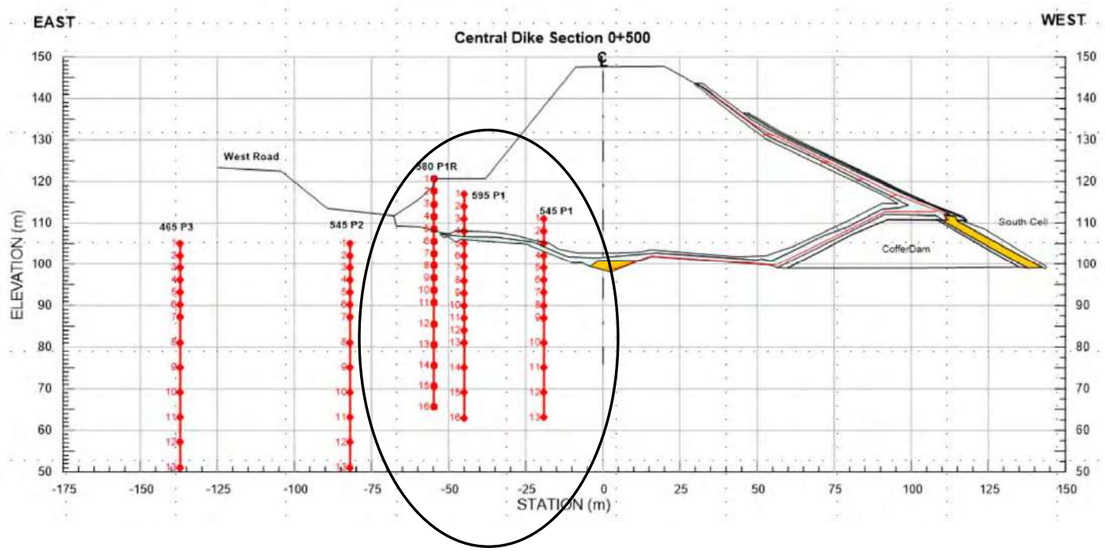


Central Dike – 595 P1

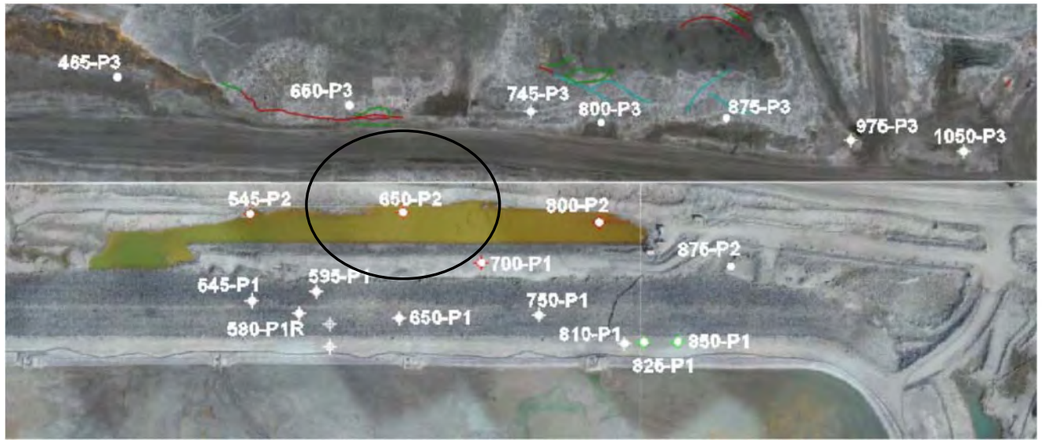


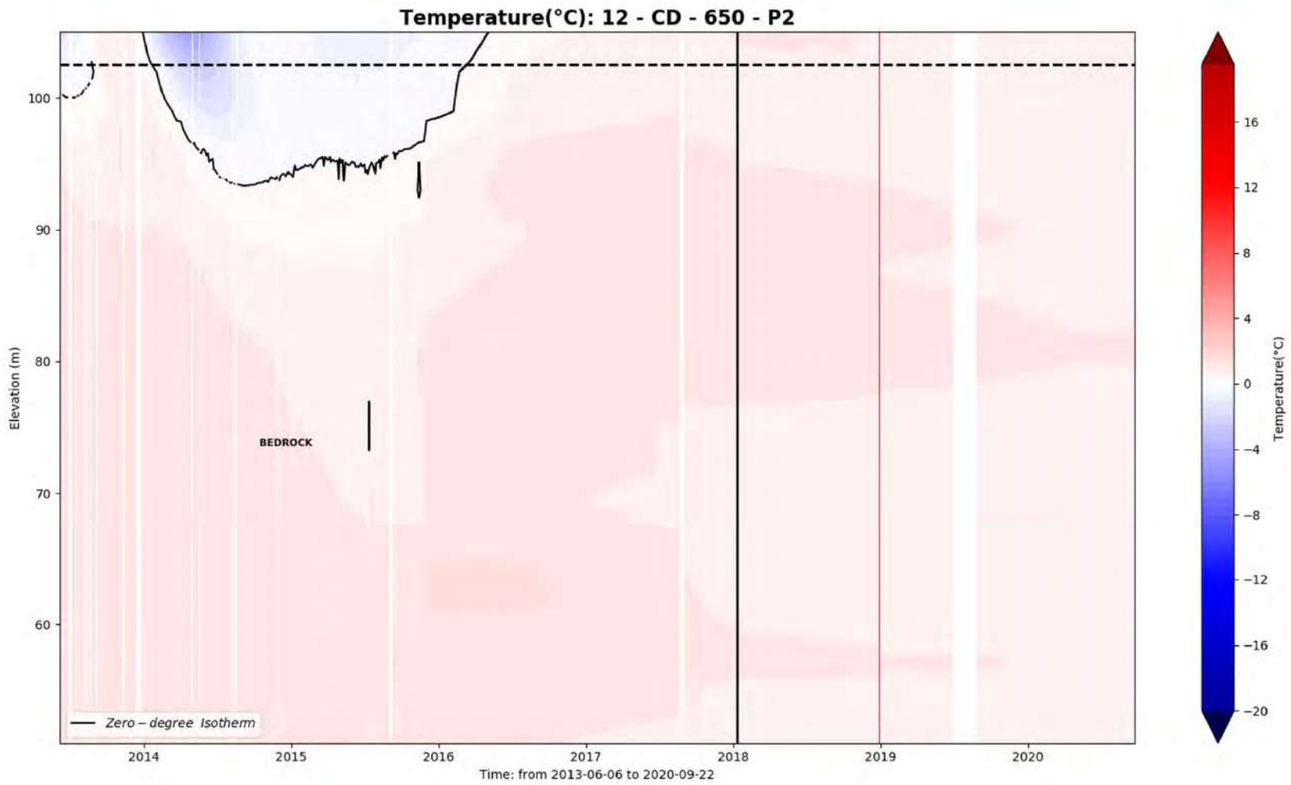


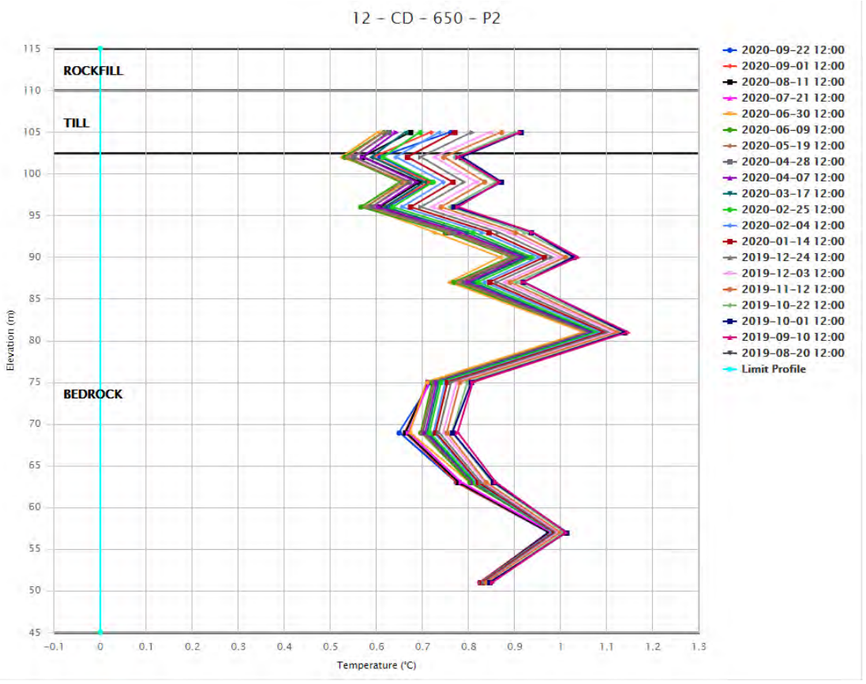


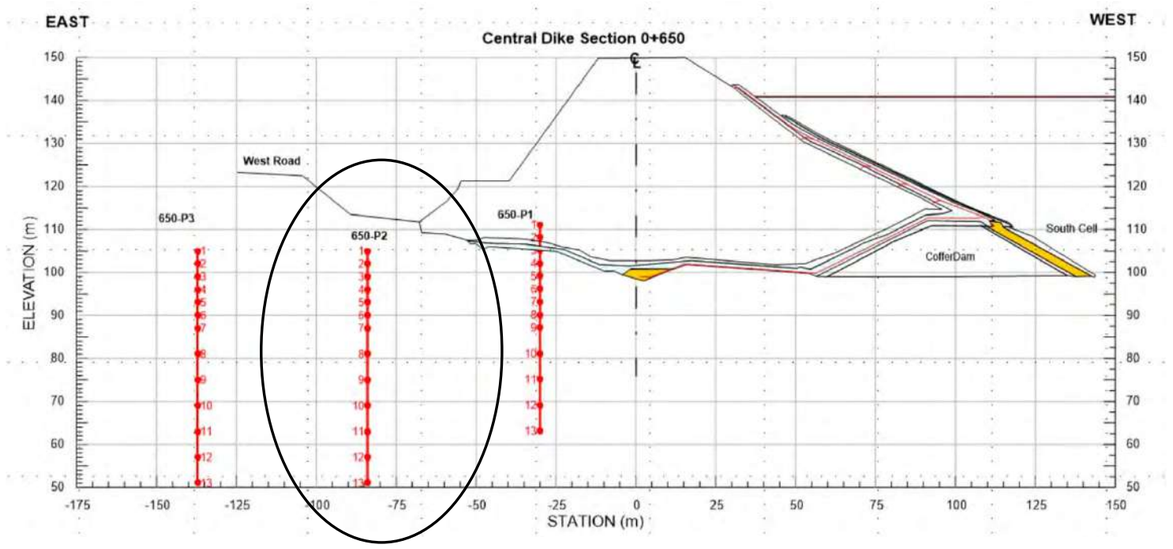


Central Dike – 650 P2

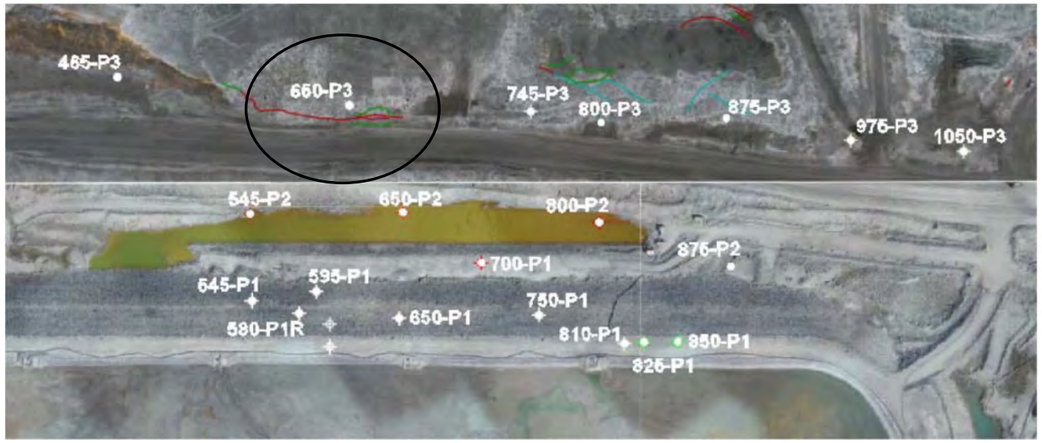


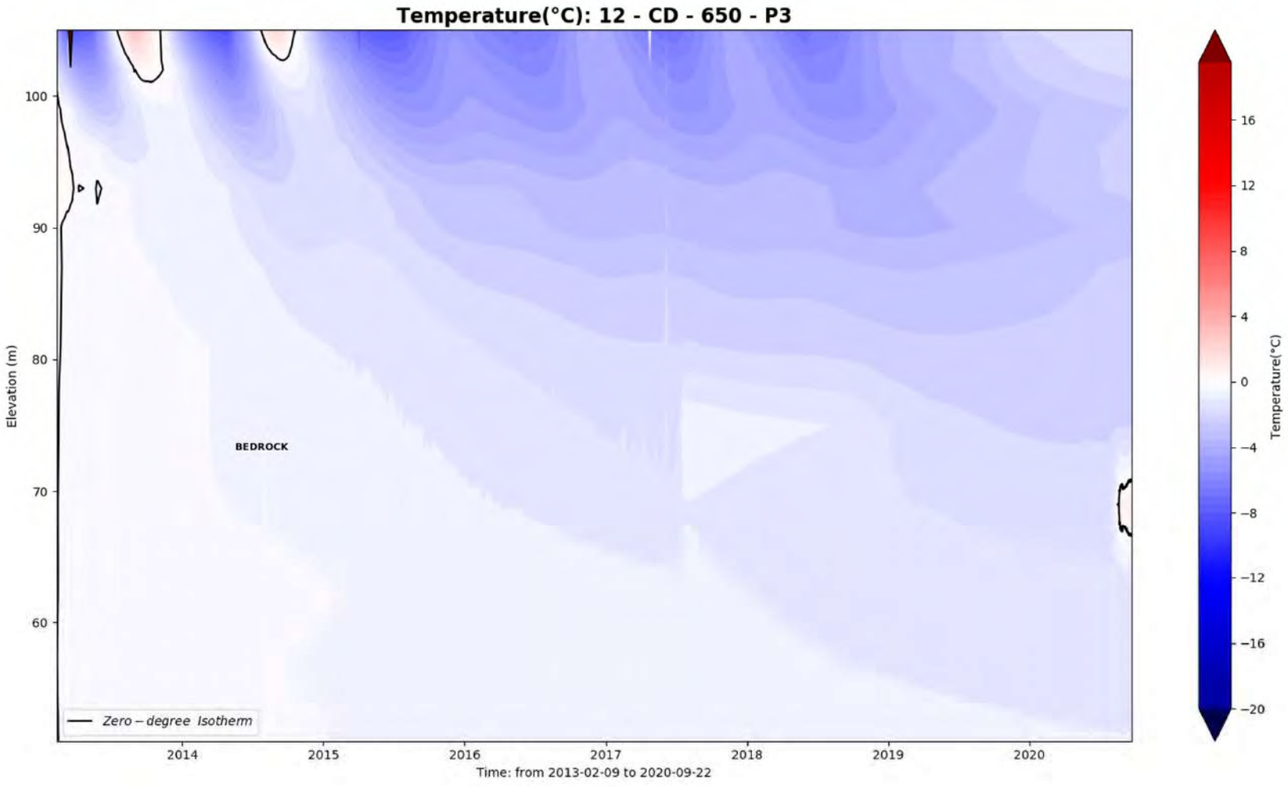


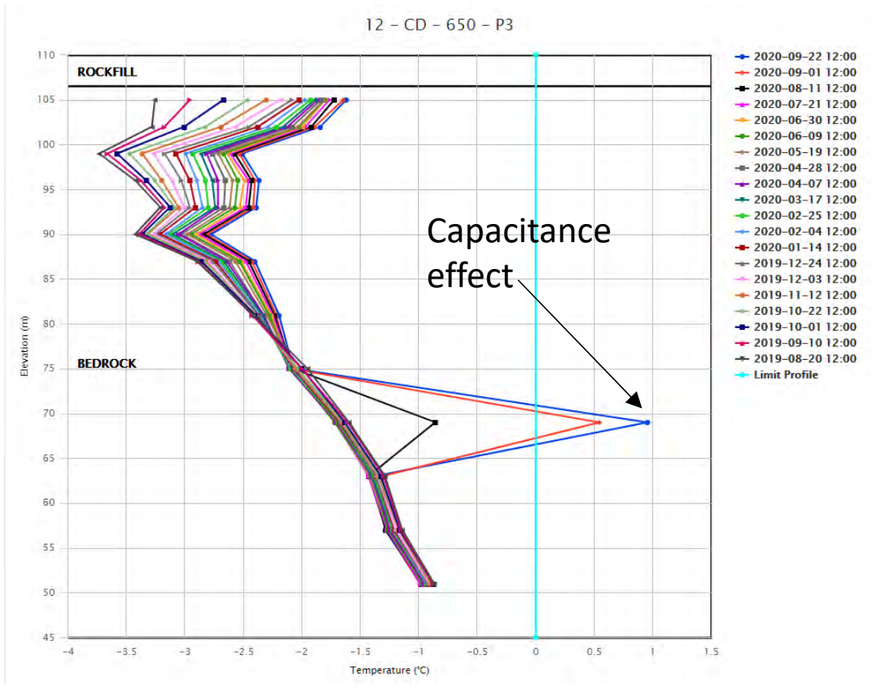


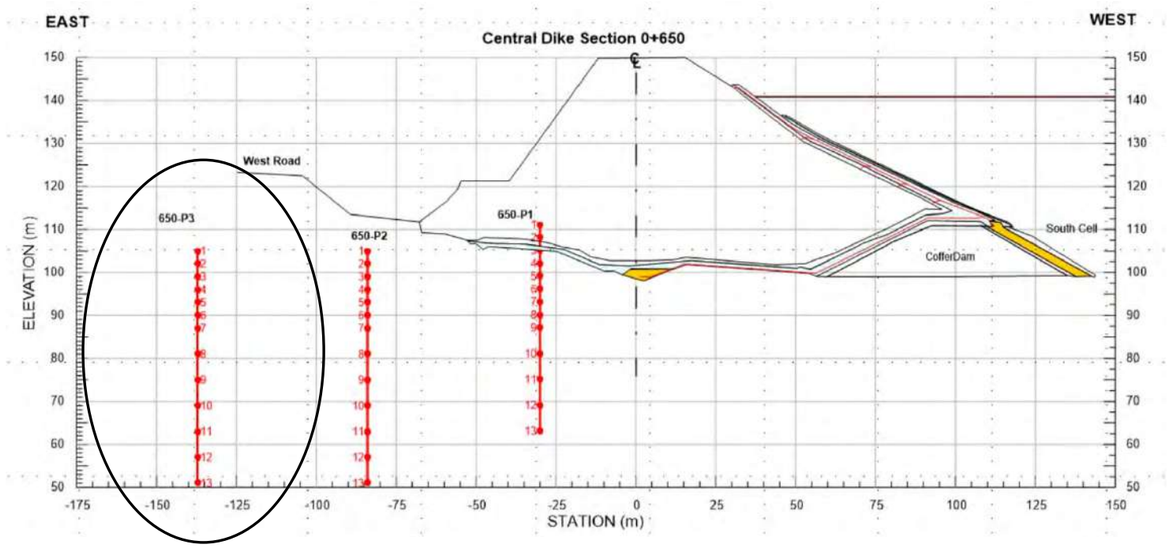


Central Dike – 650 P3



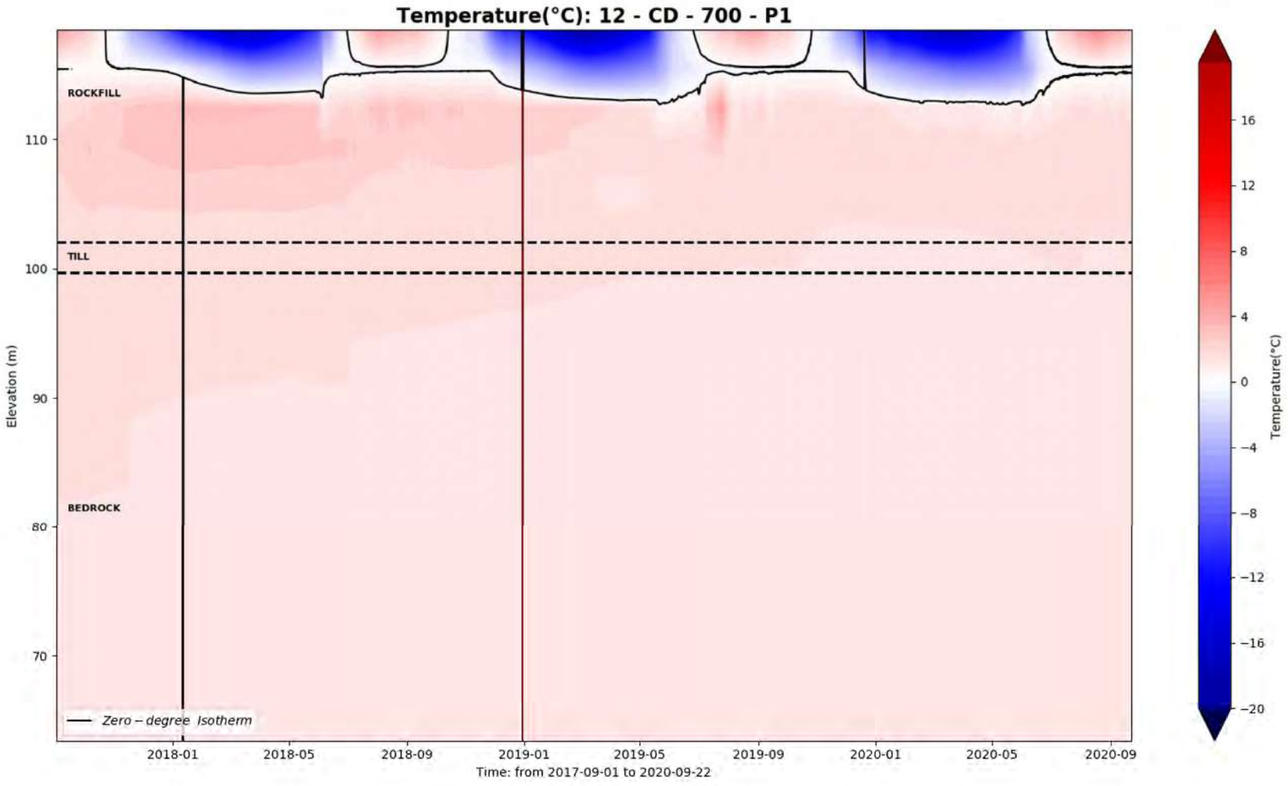


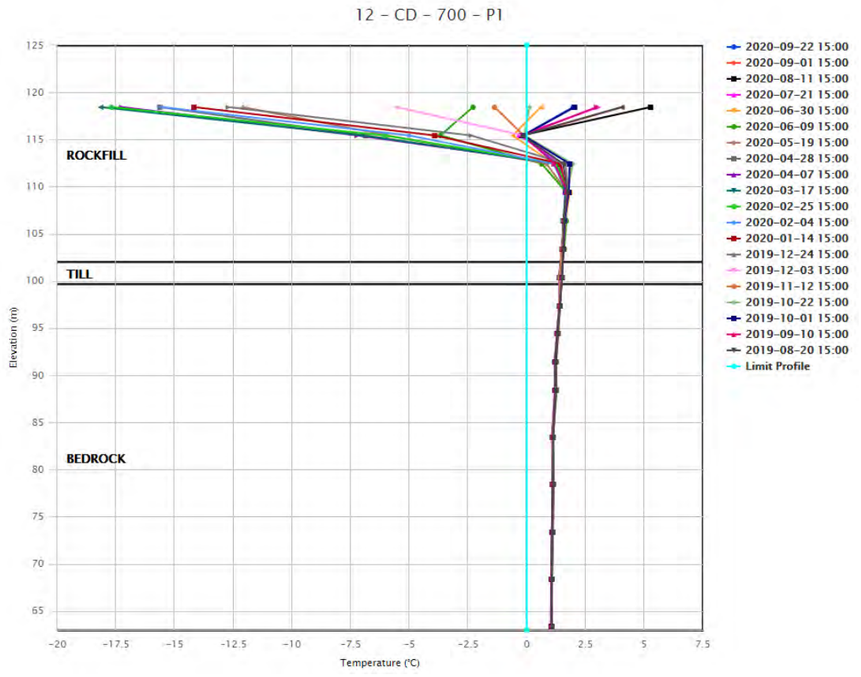


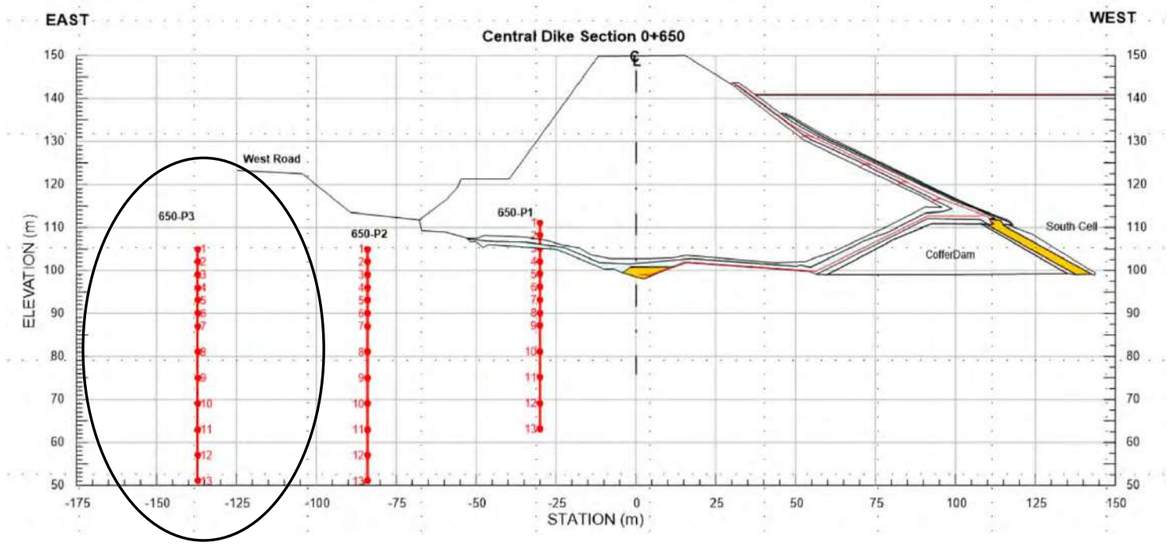


Central Dike – 700 P1

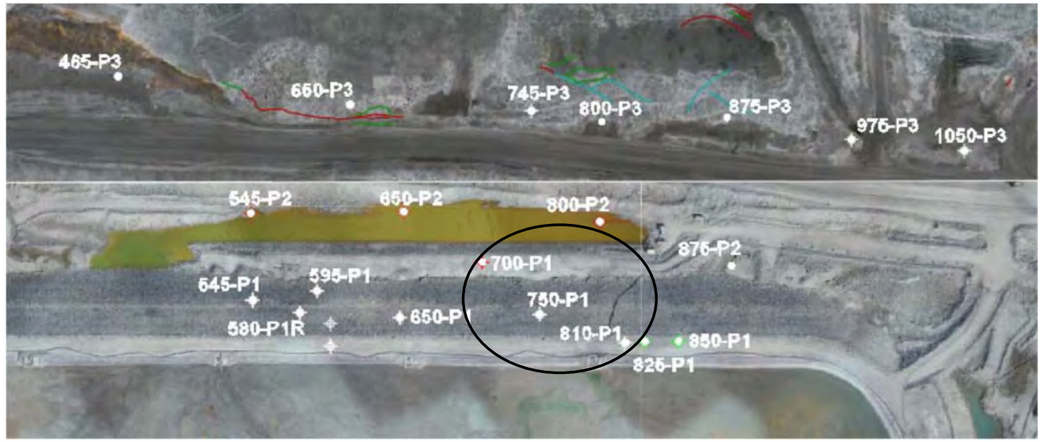


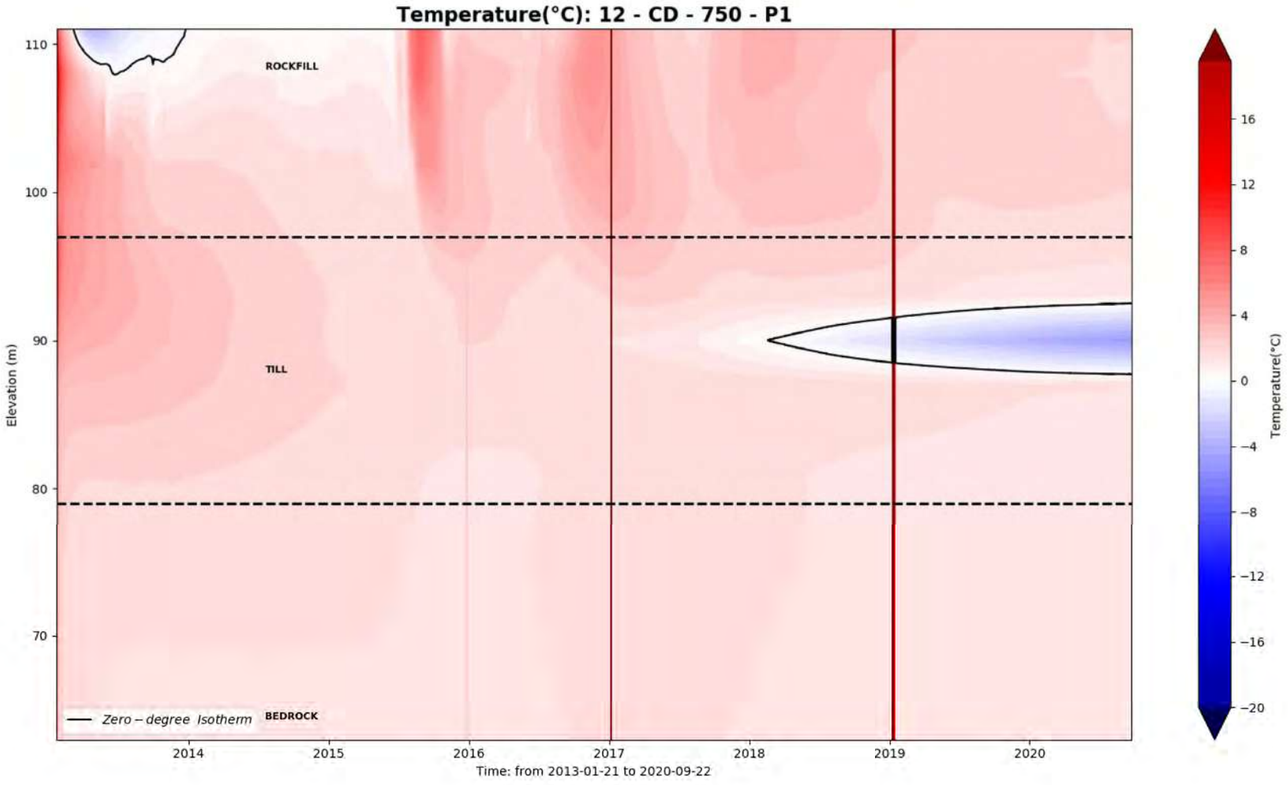


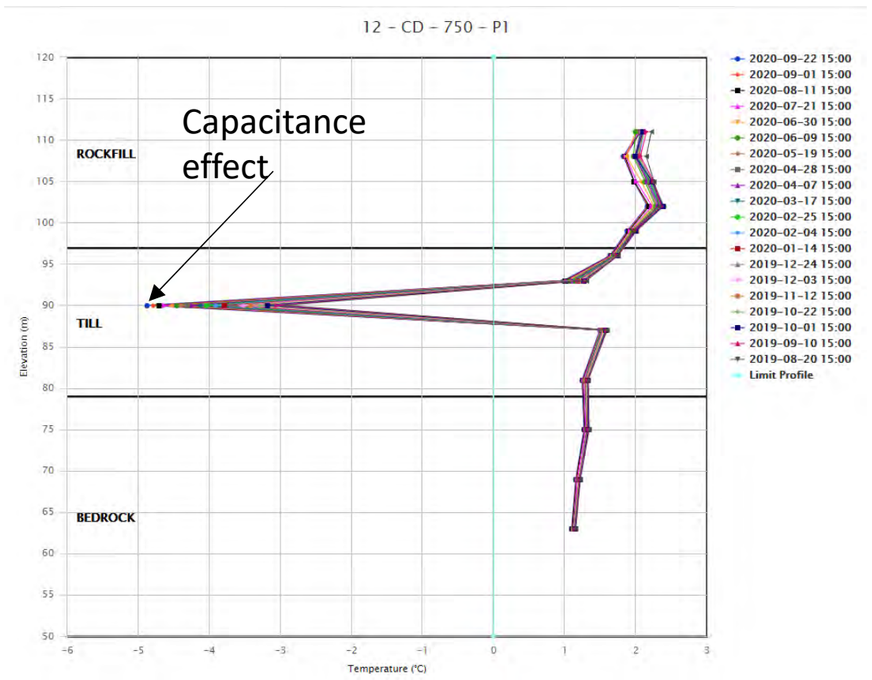


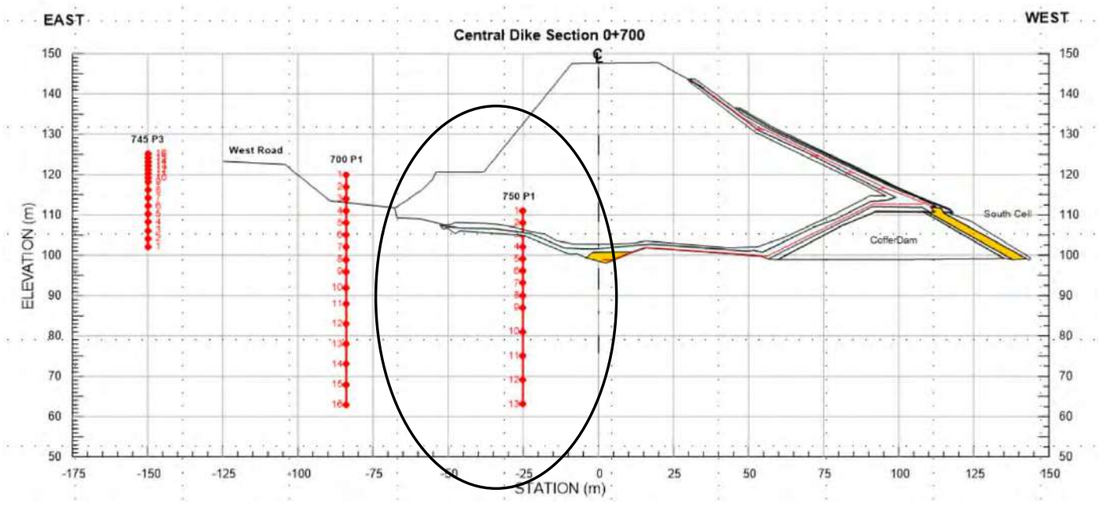


Central Dike – 750 P1

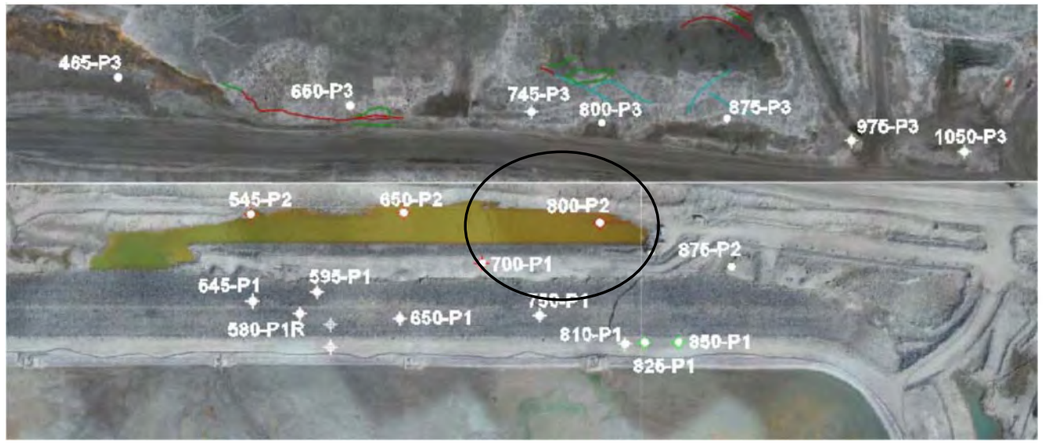


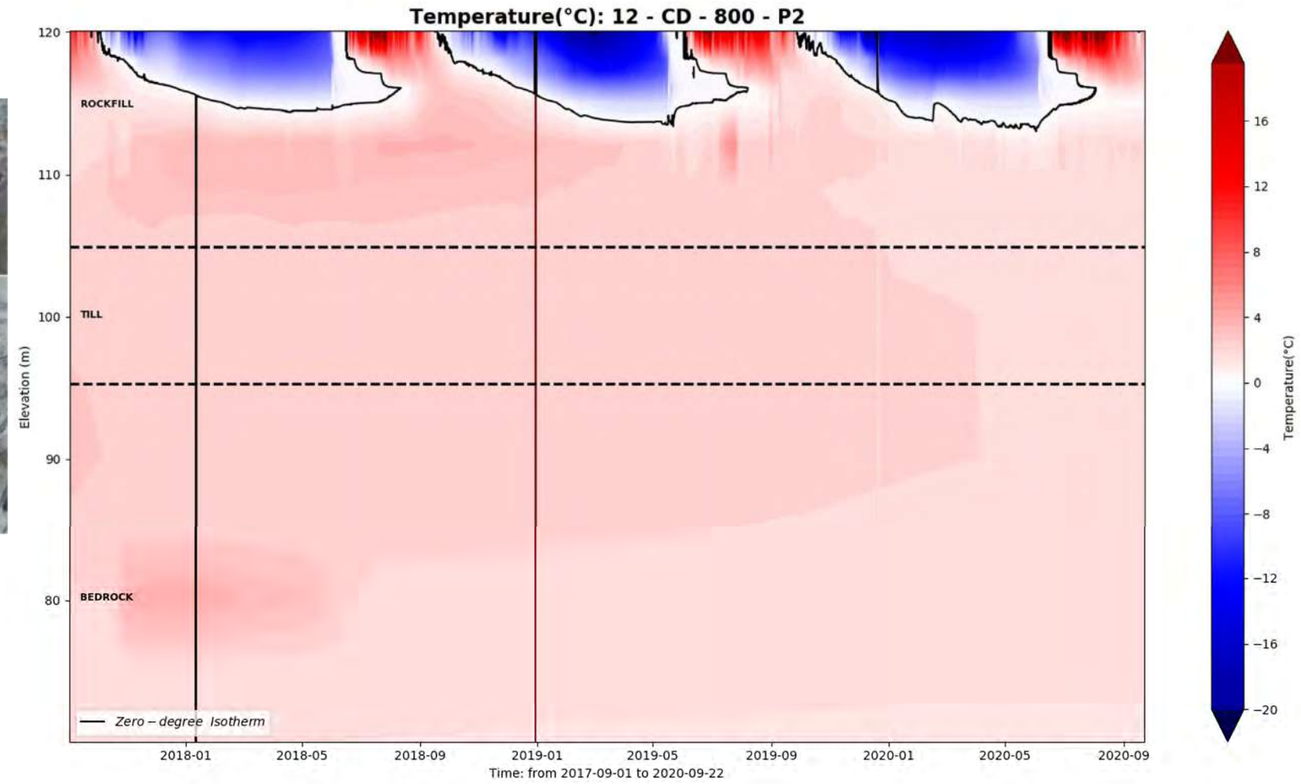


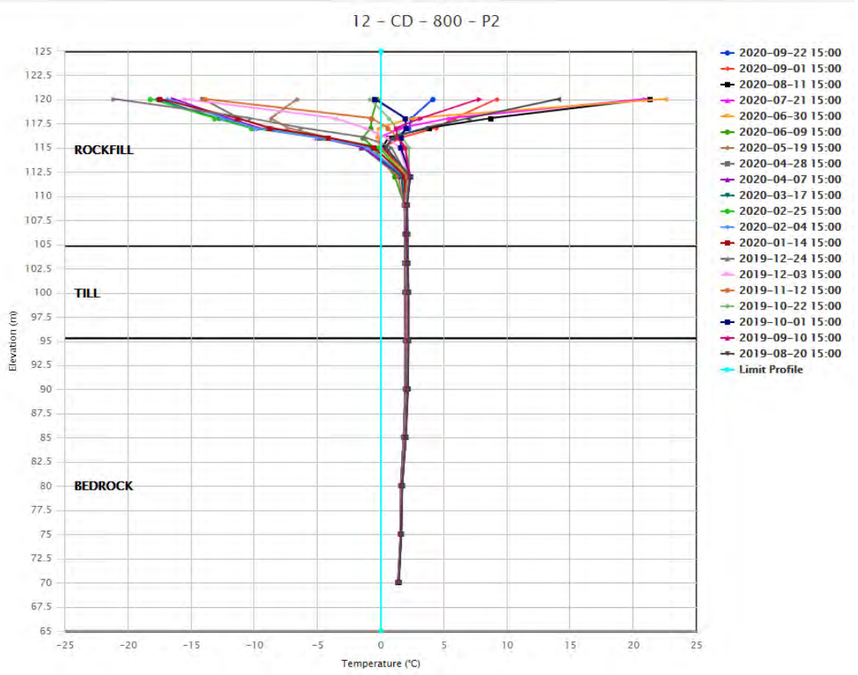


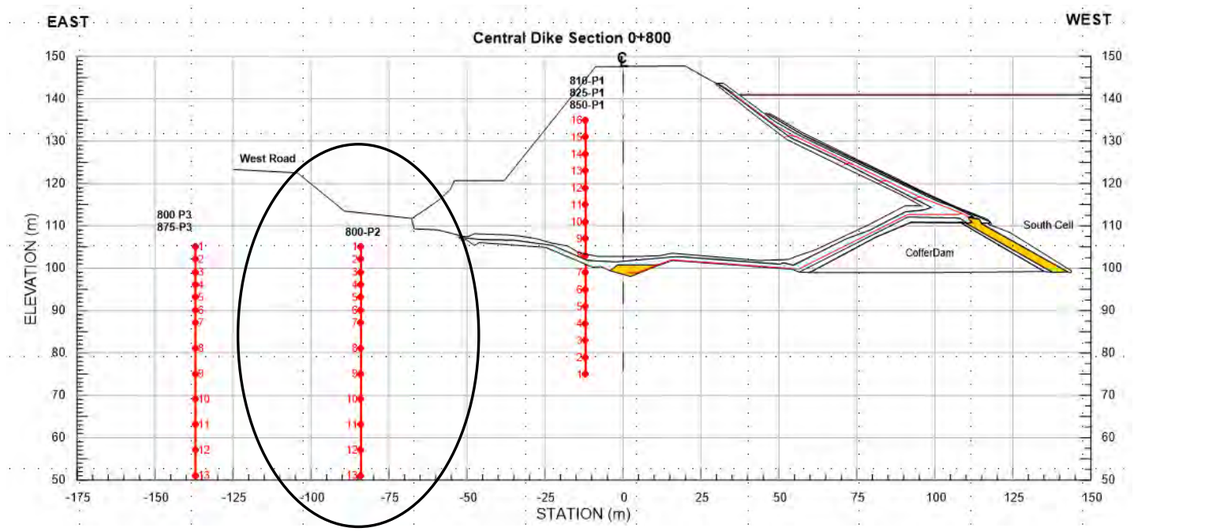


Central Dike – 800 P2

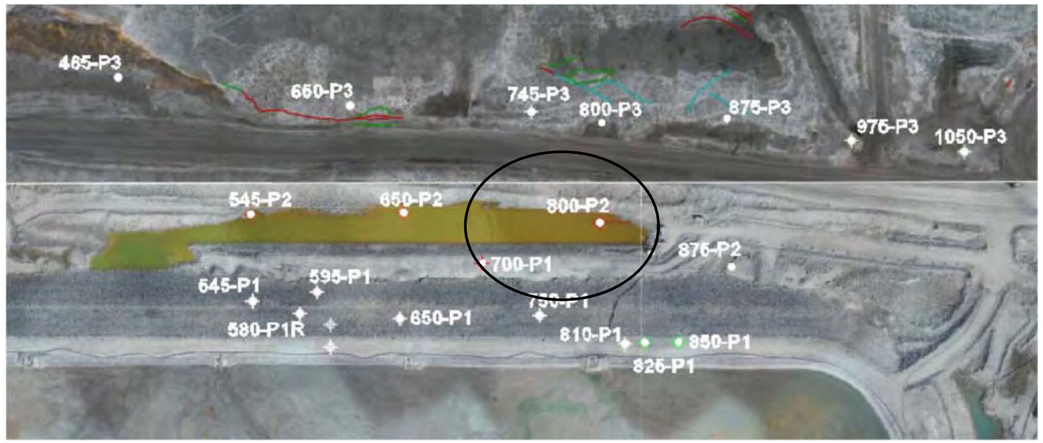


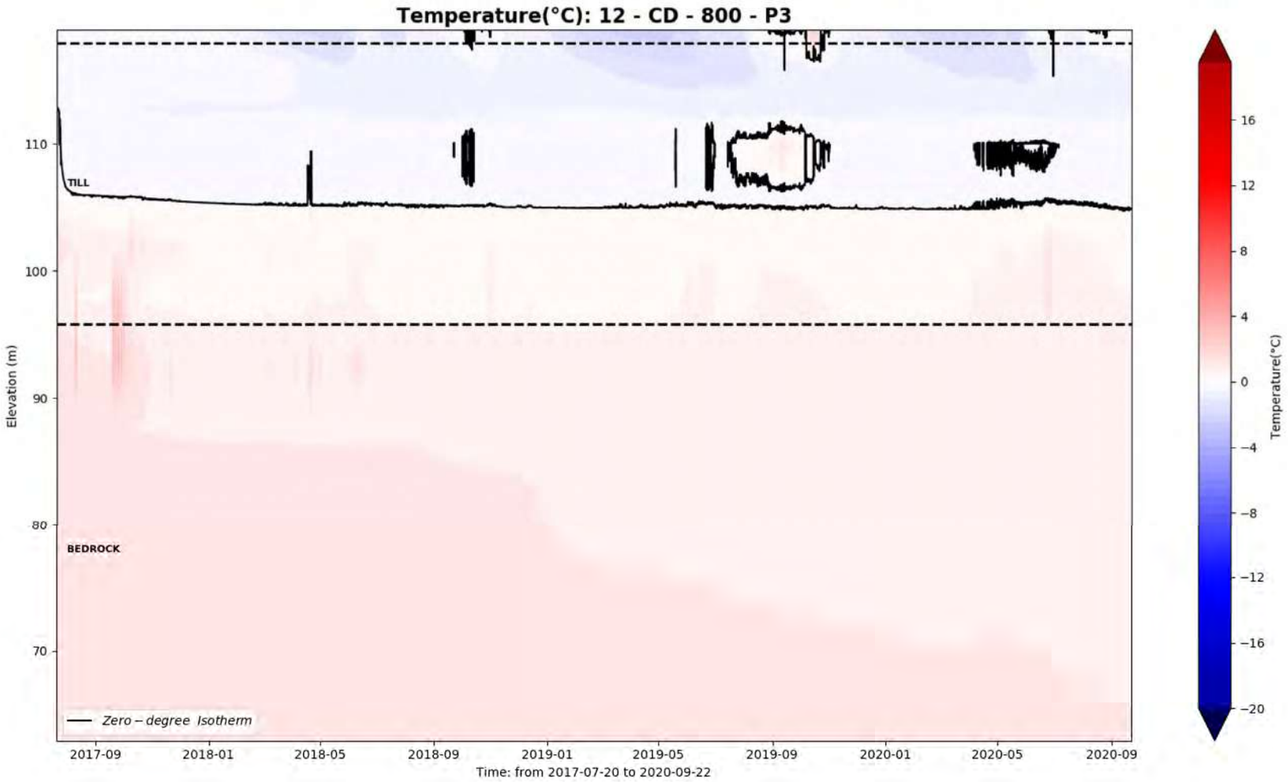


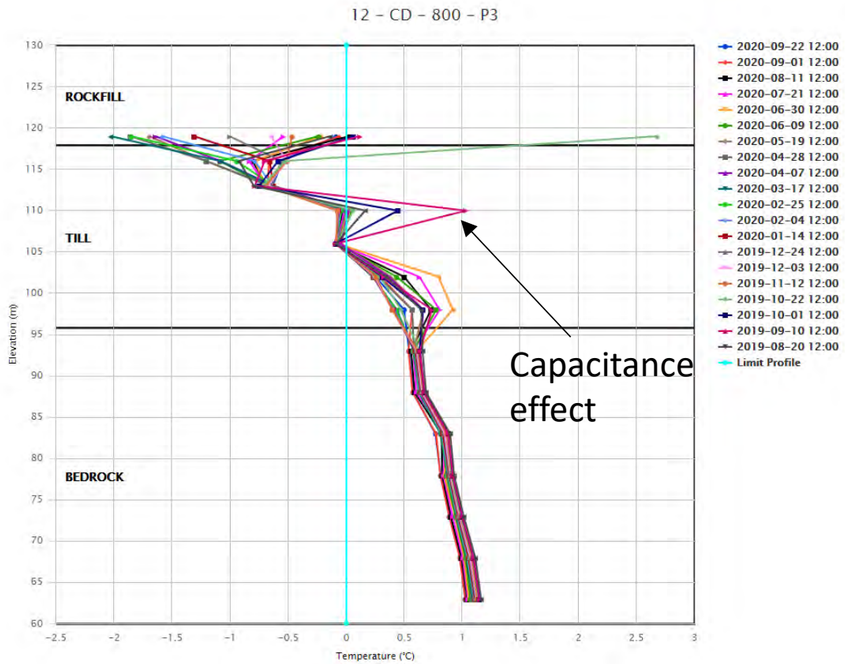


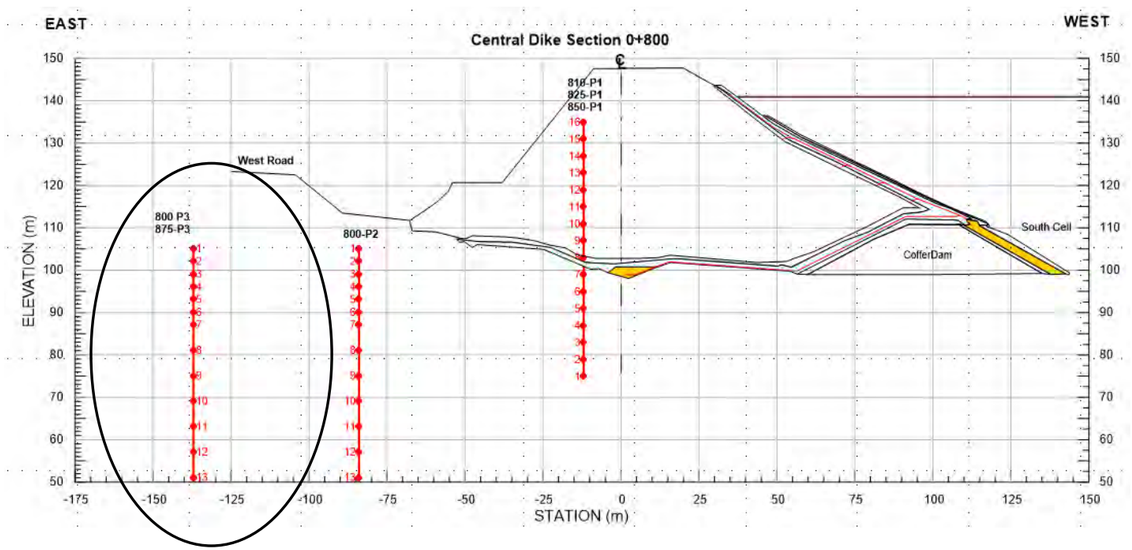


Central Dike – 800 P3



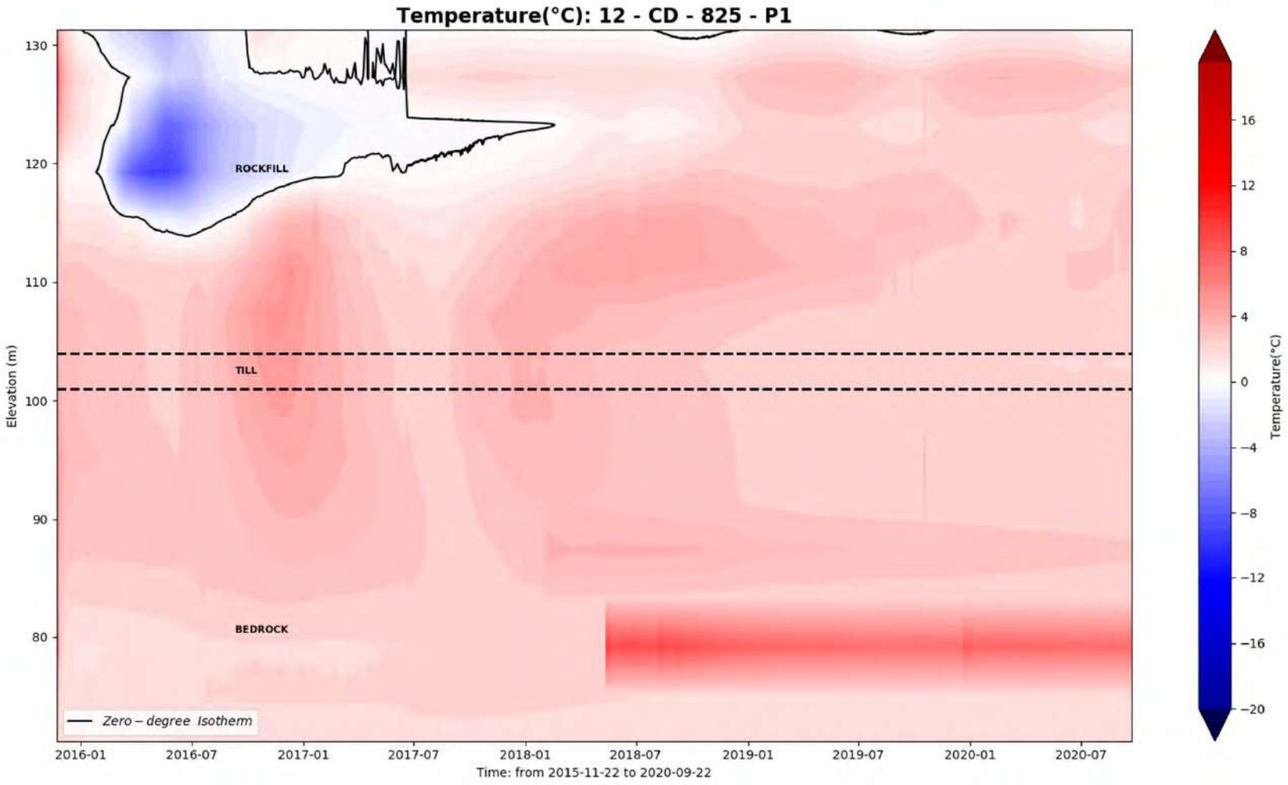


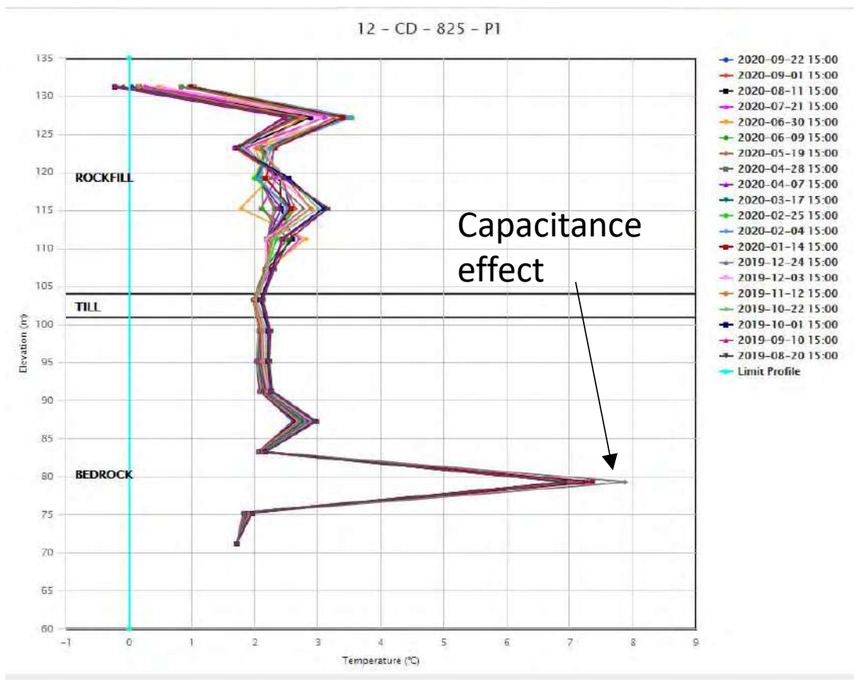


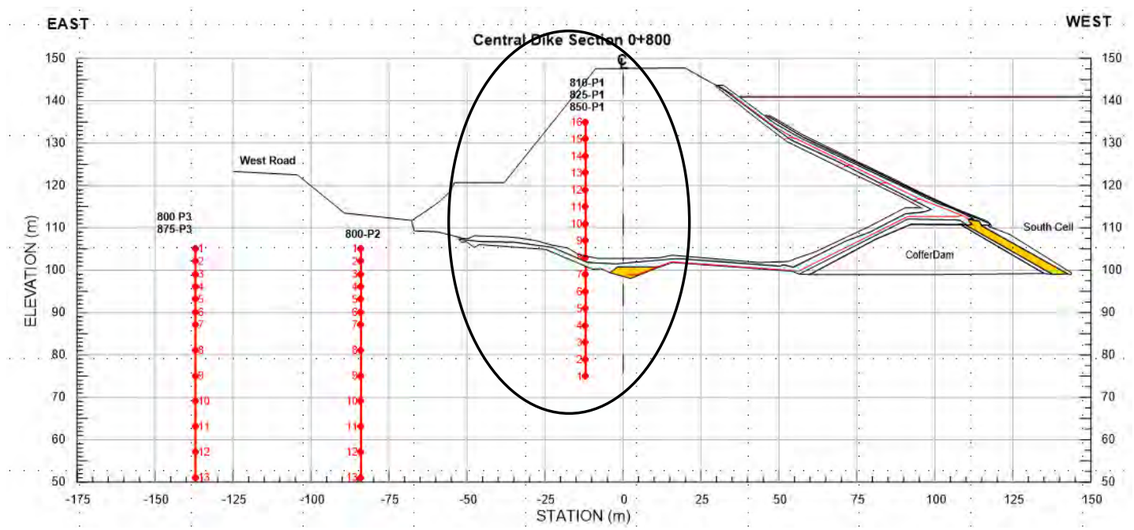


Central Dike – 825 P1



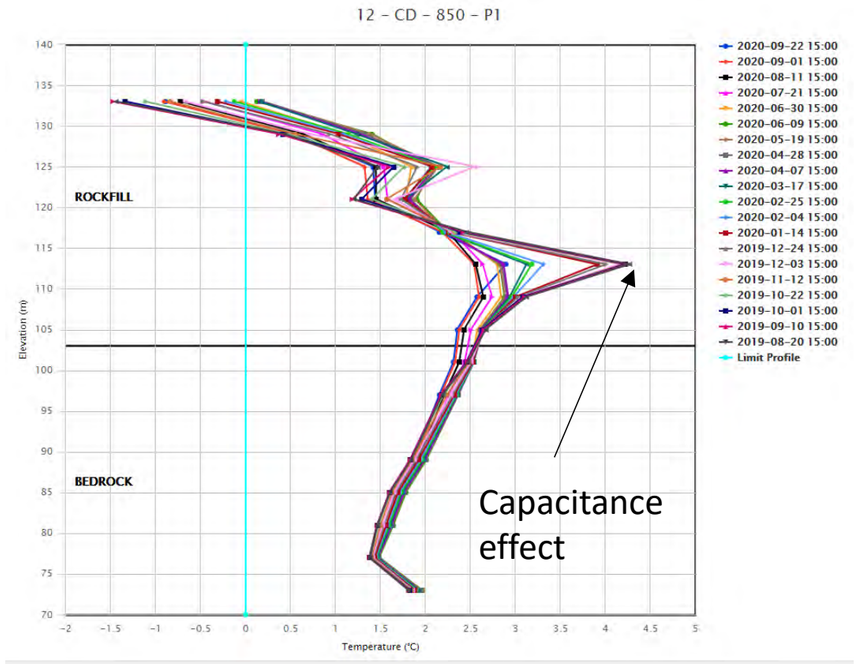


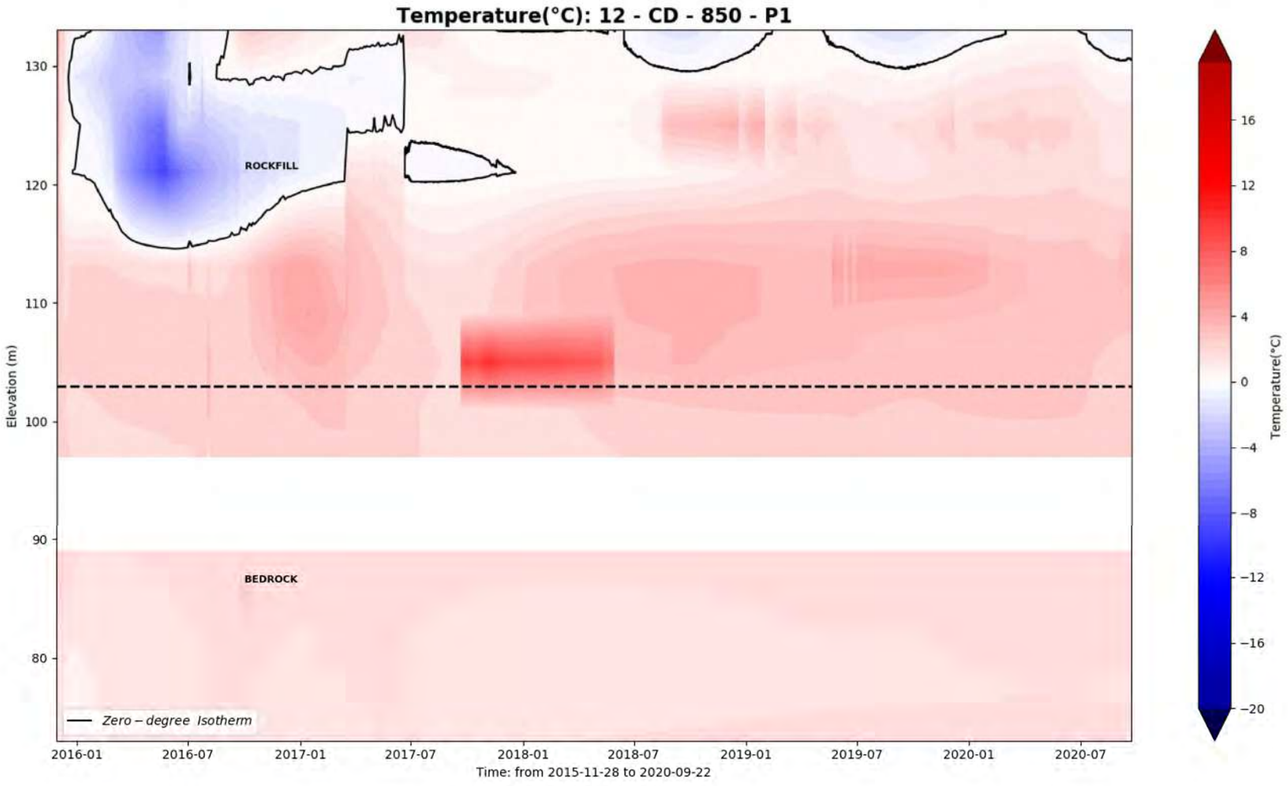


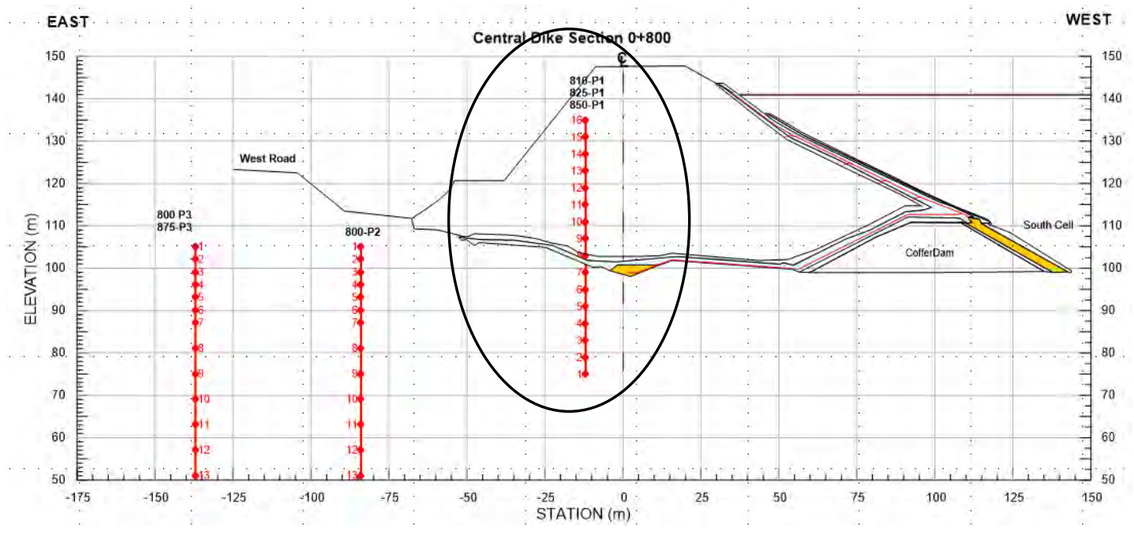


Central Dike – 850 P1

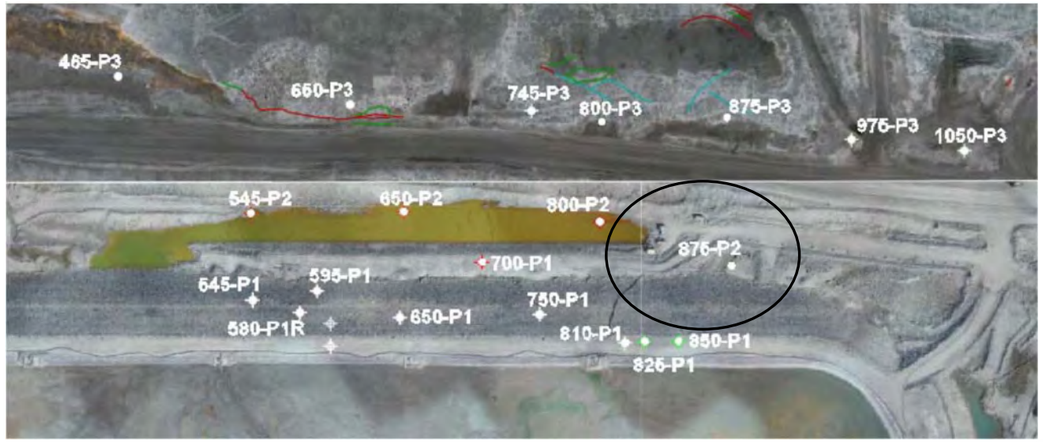


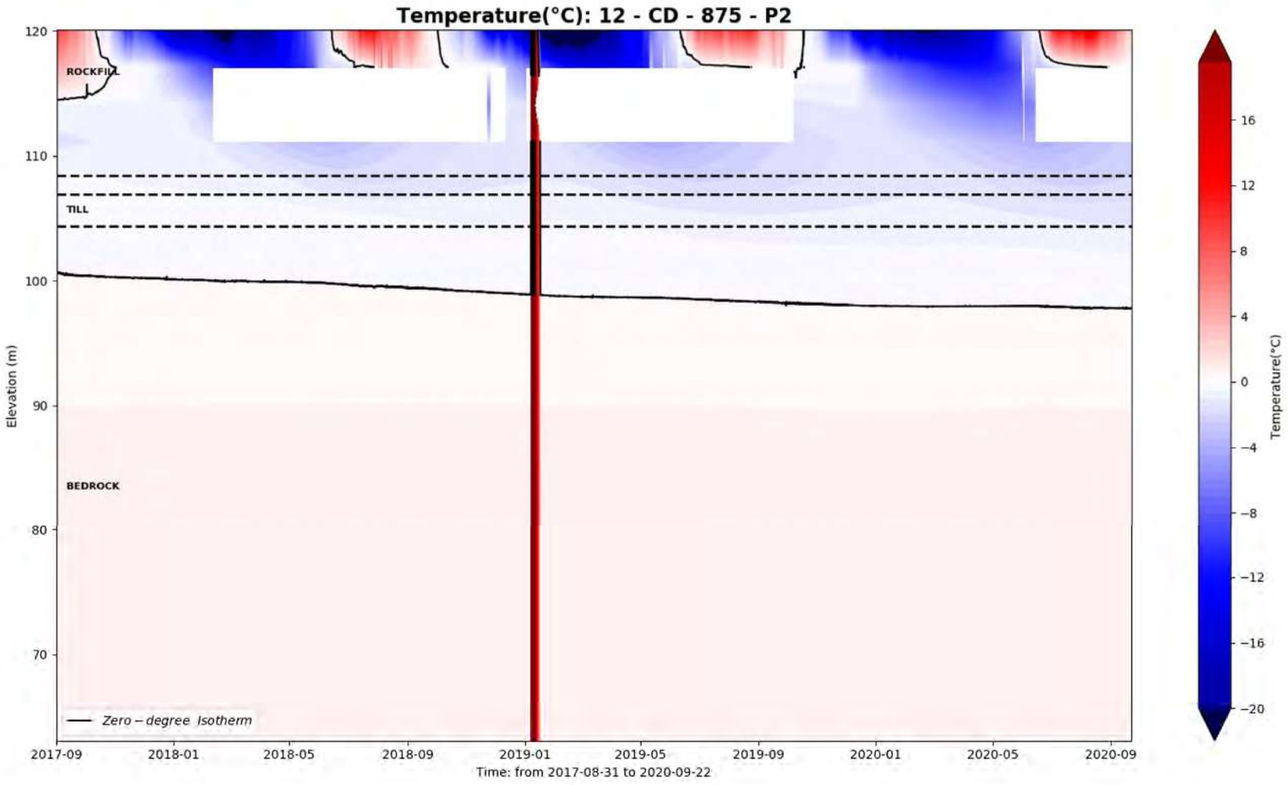


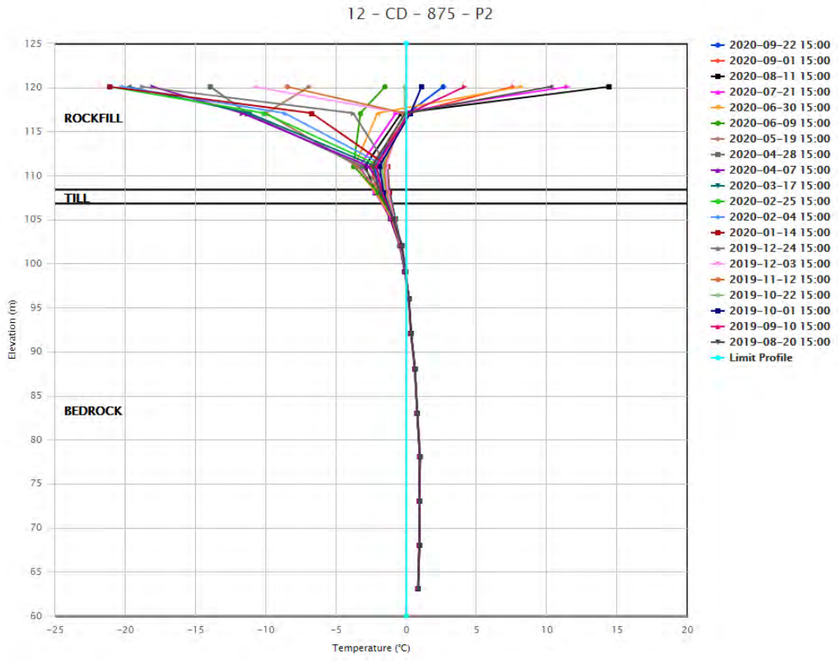


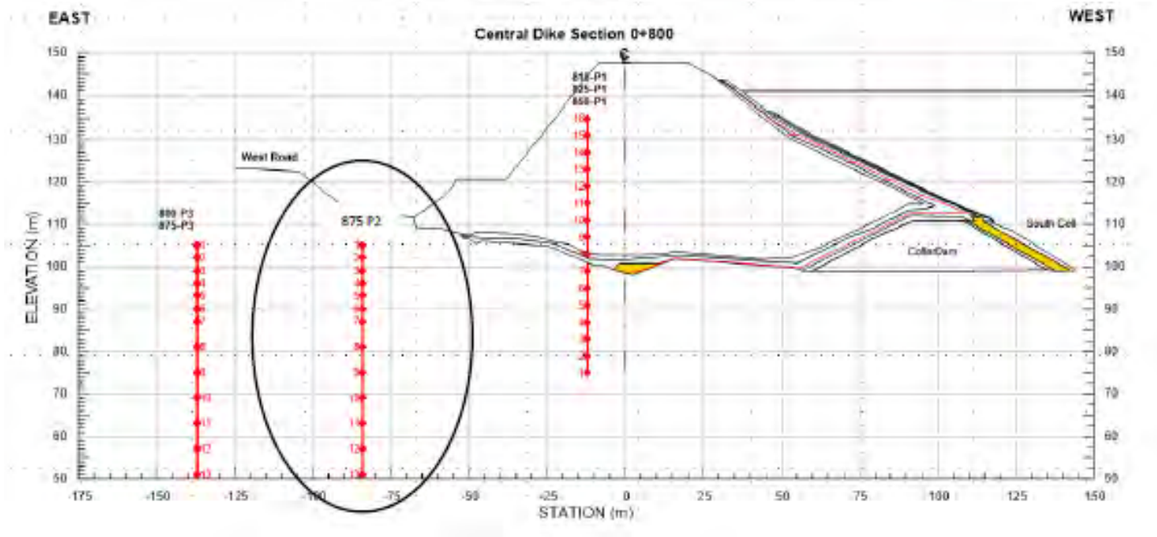


Central Dike – 875 P2

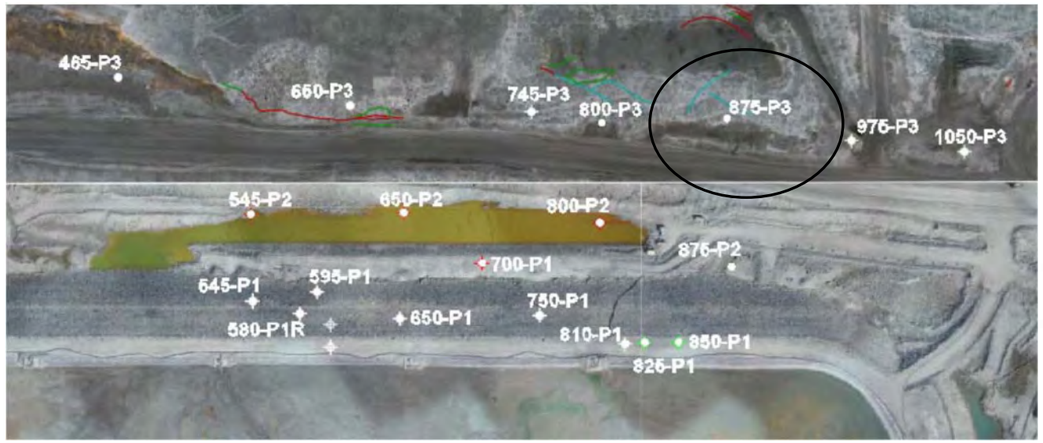


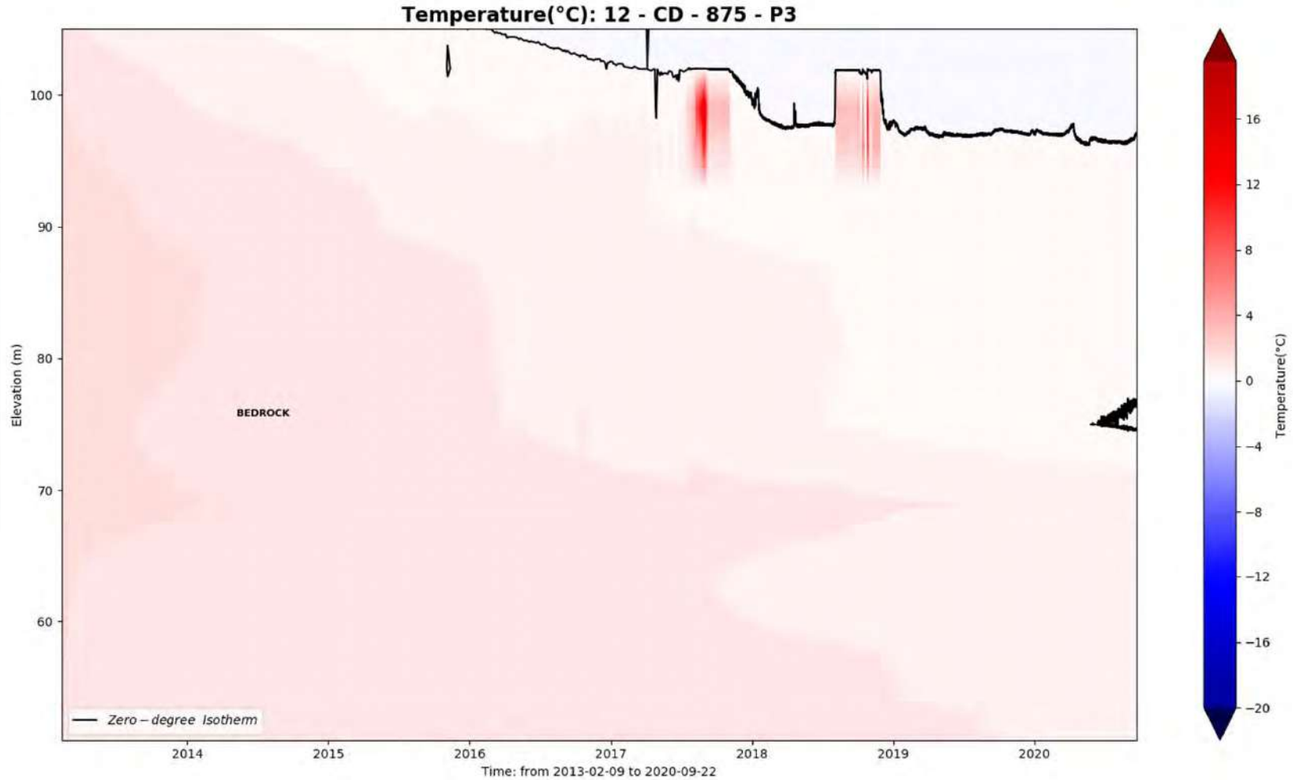


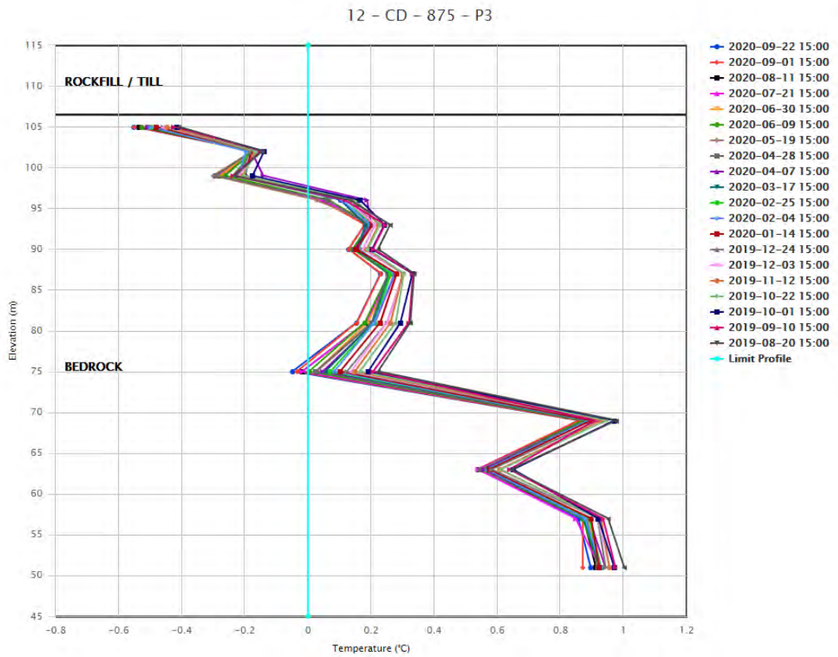


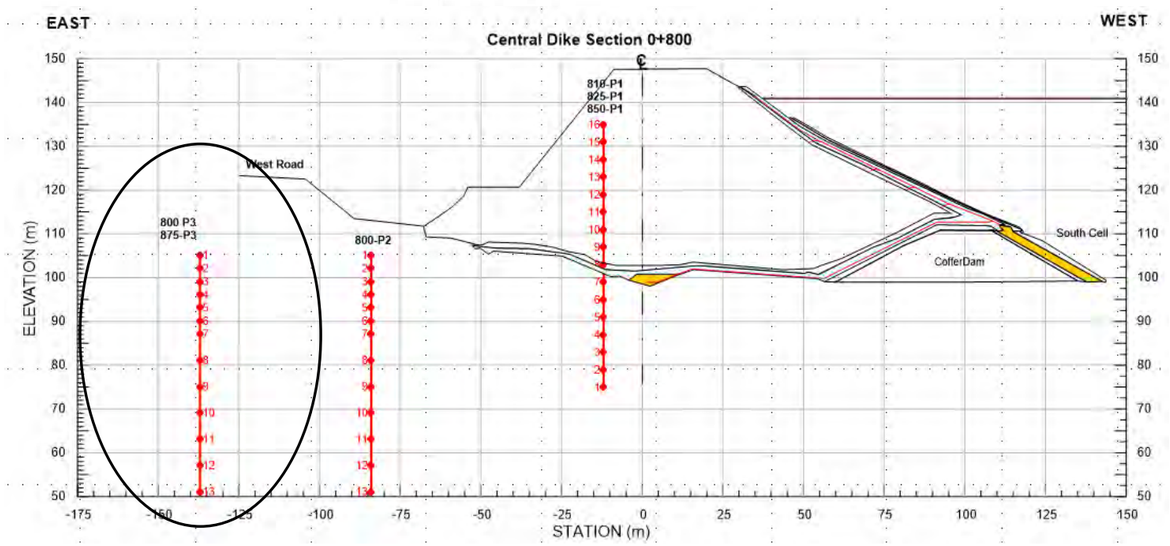


Central Dike – 875 P3



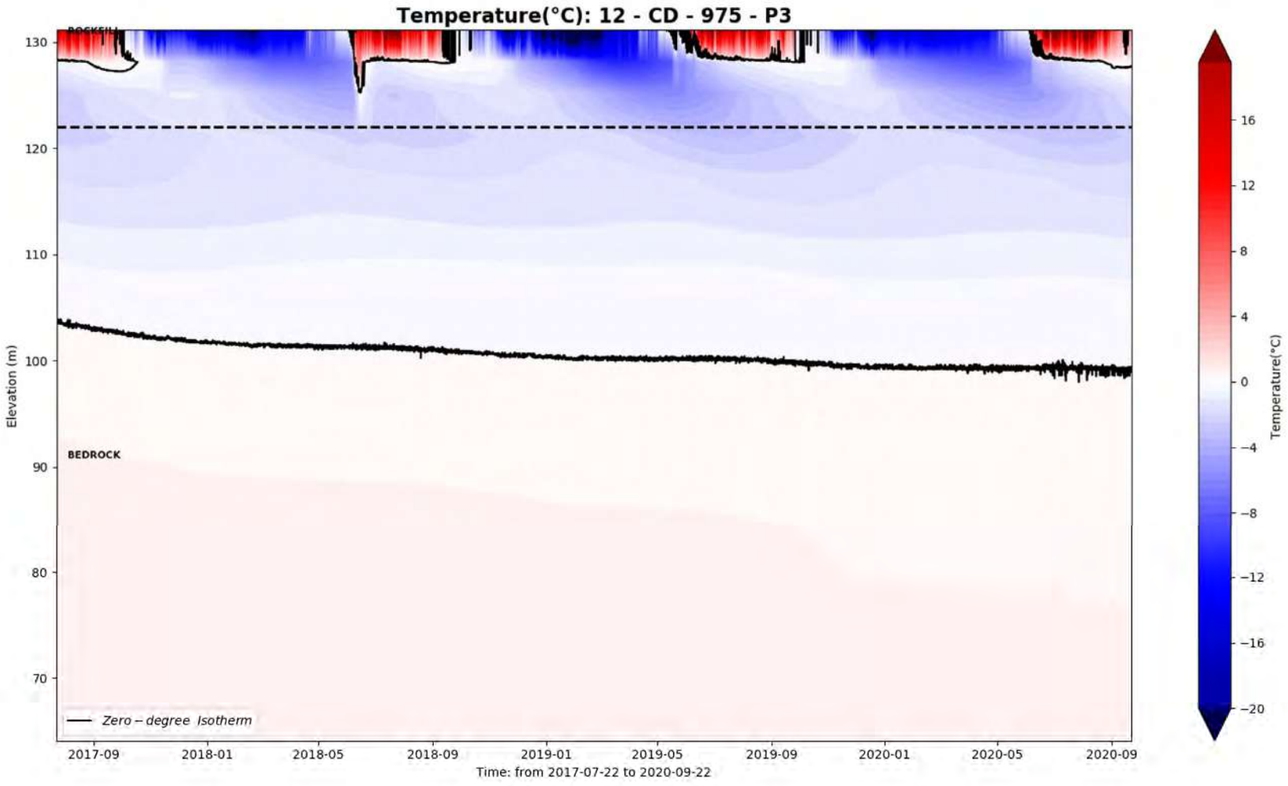


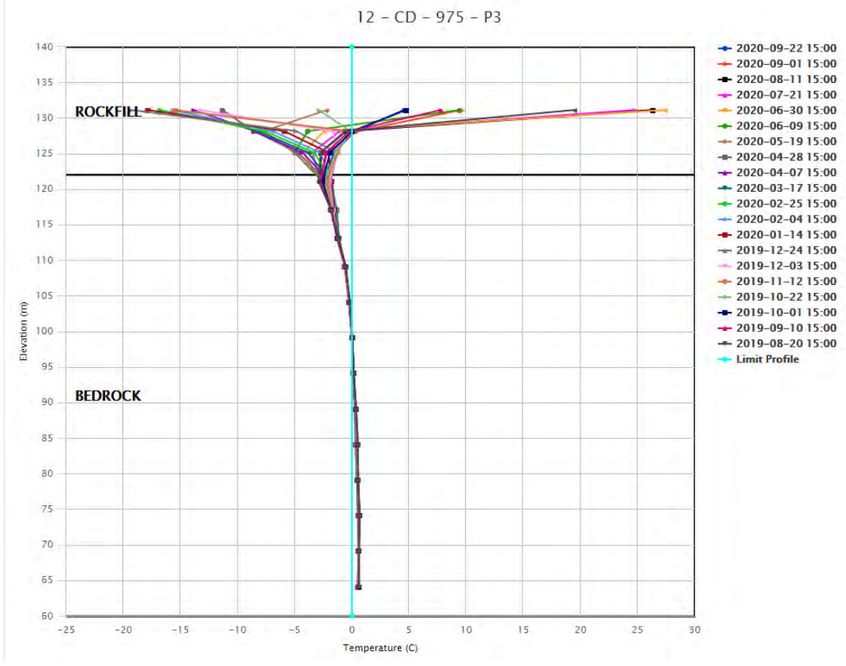


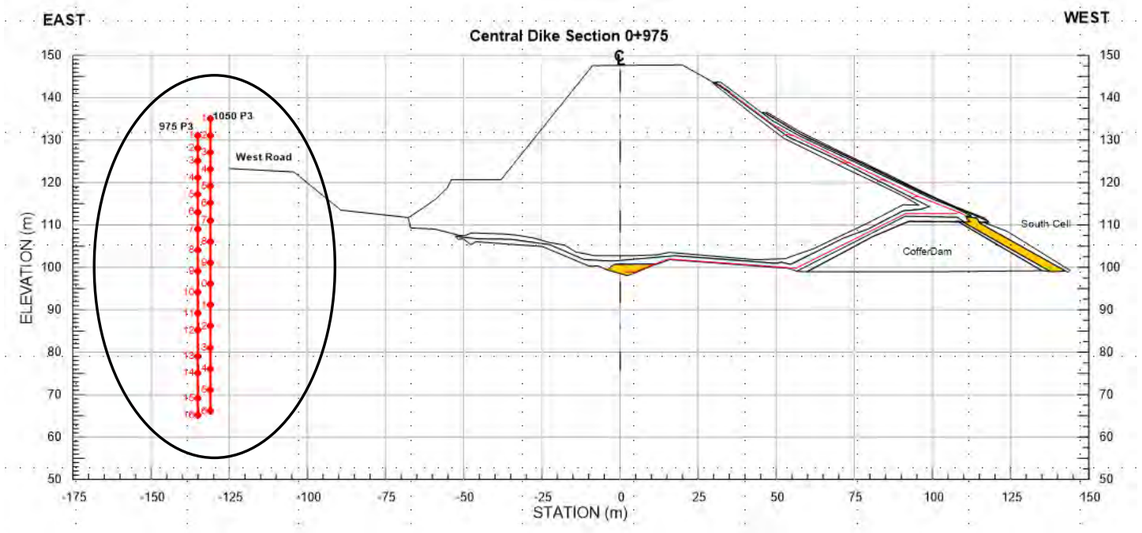


Central Dike – 975 P3

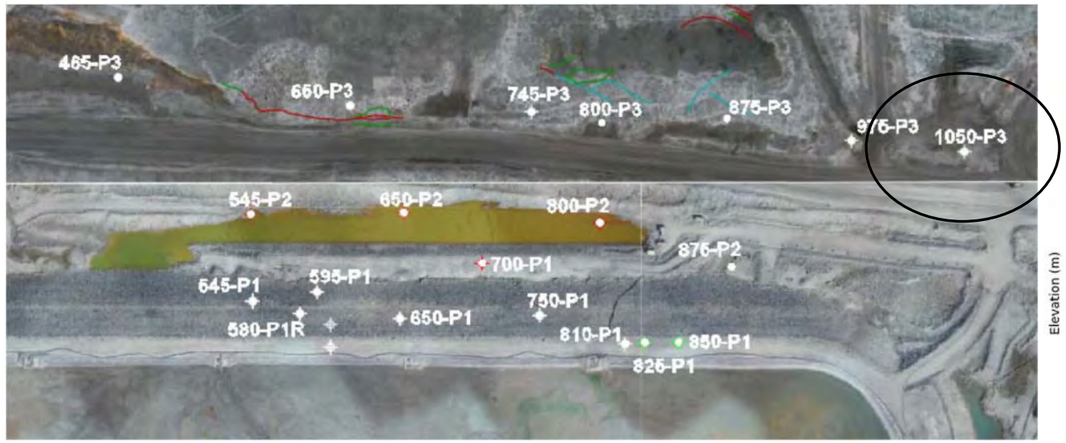


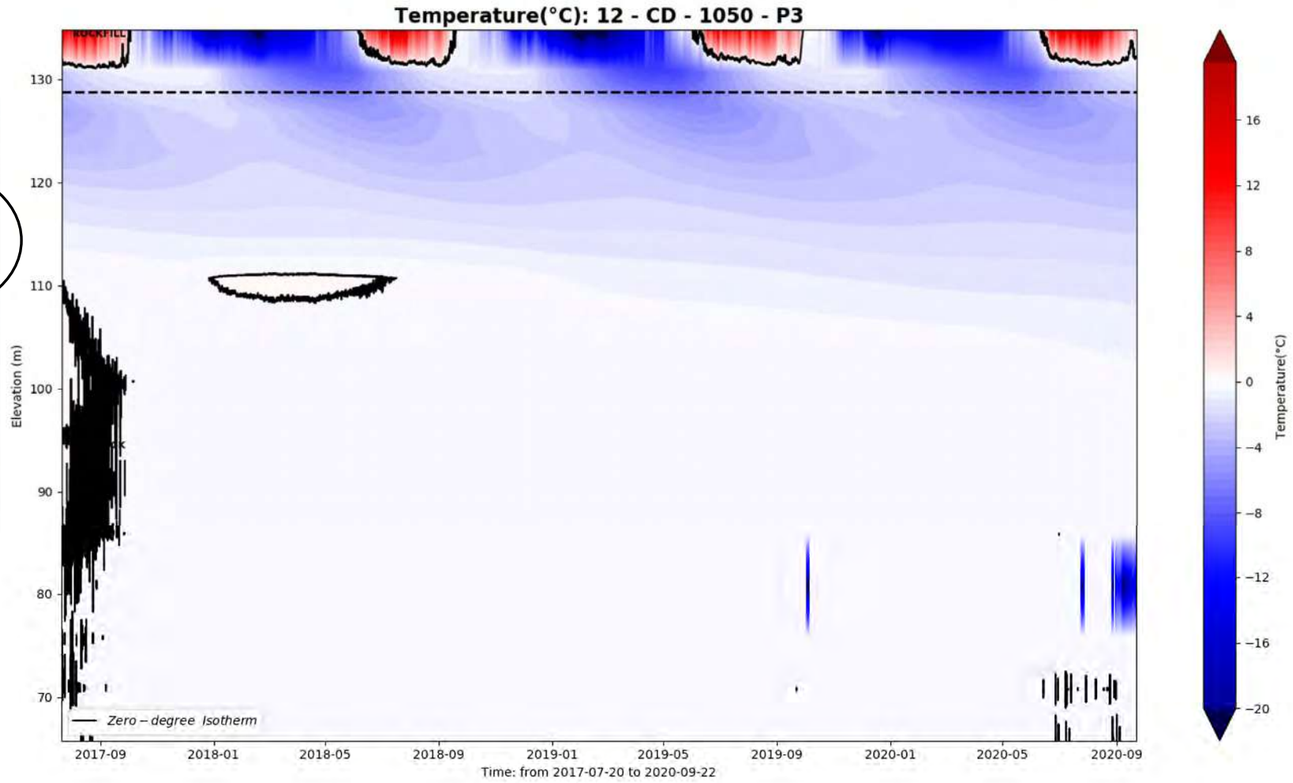


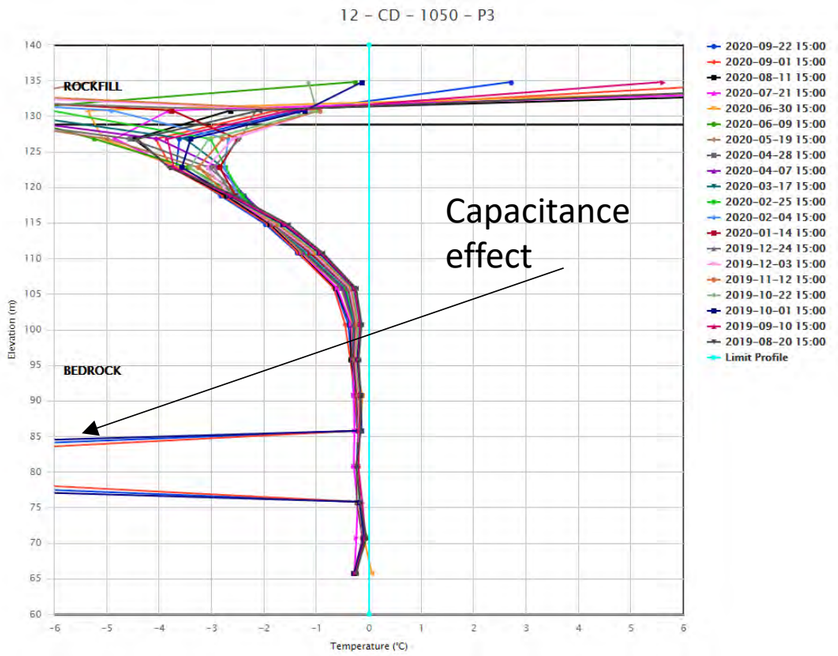


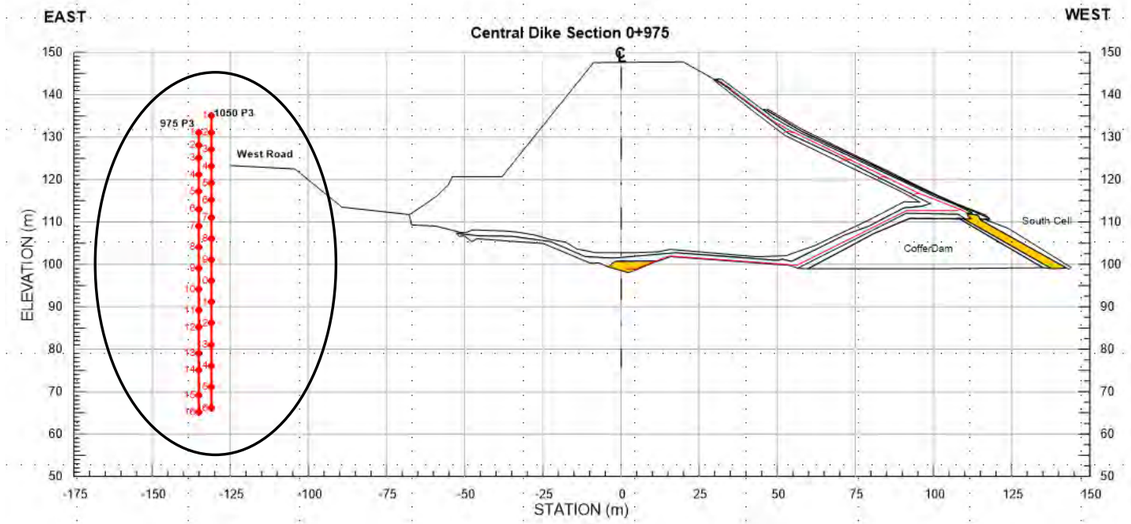


Central Dike – 1050 P3

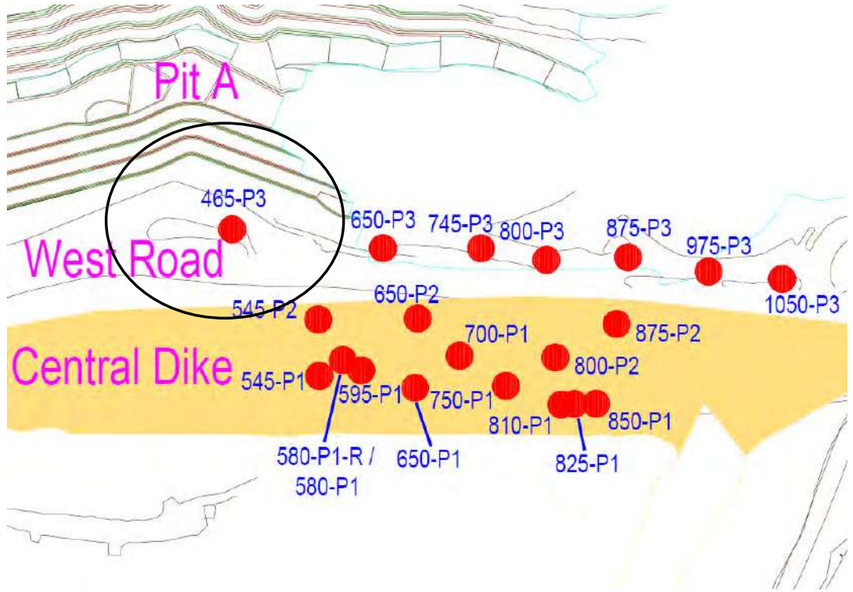


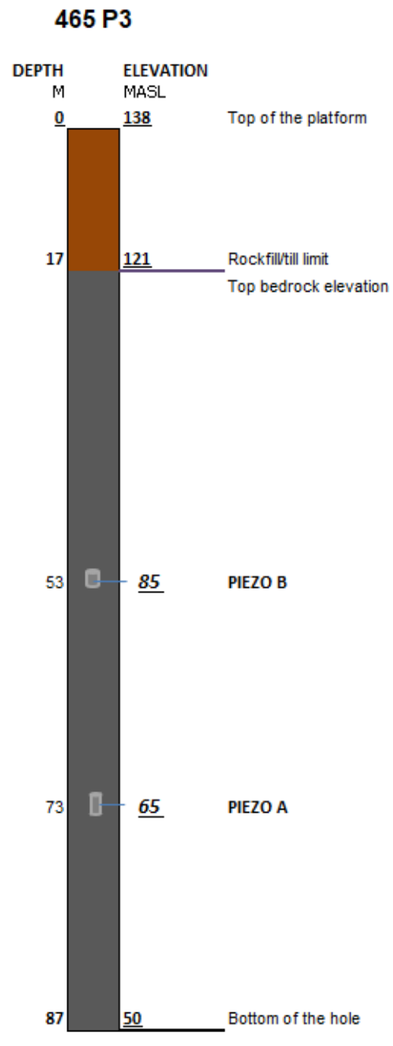


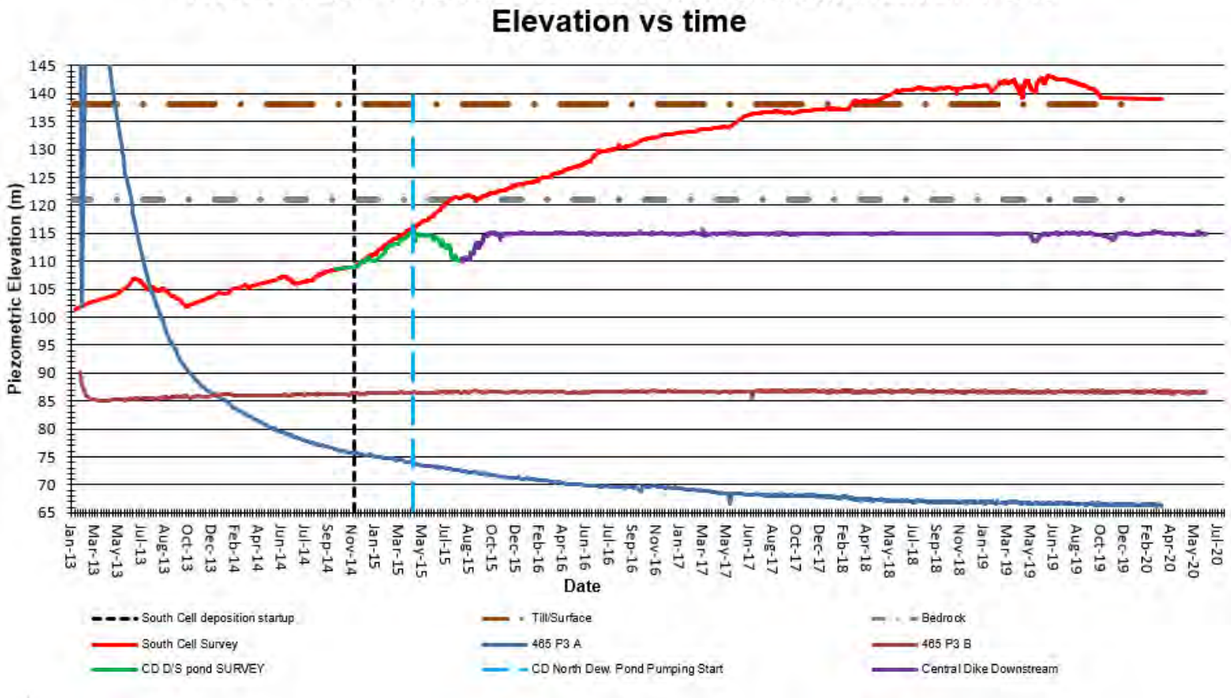




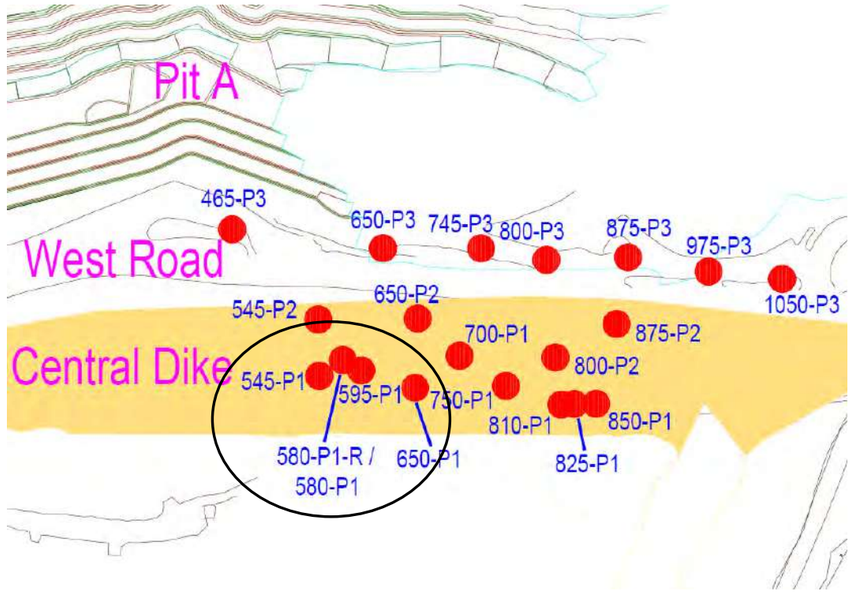
Central Dike – 465 P3



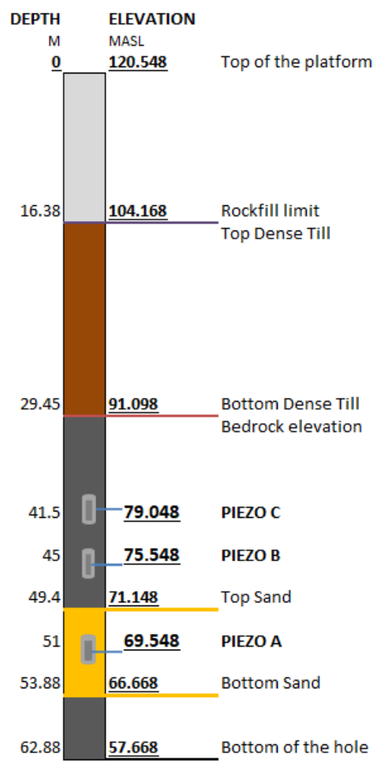




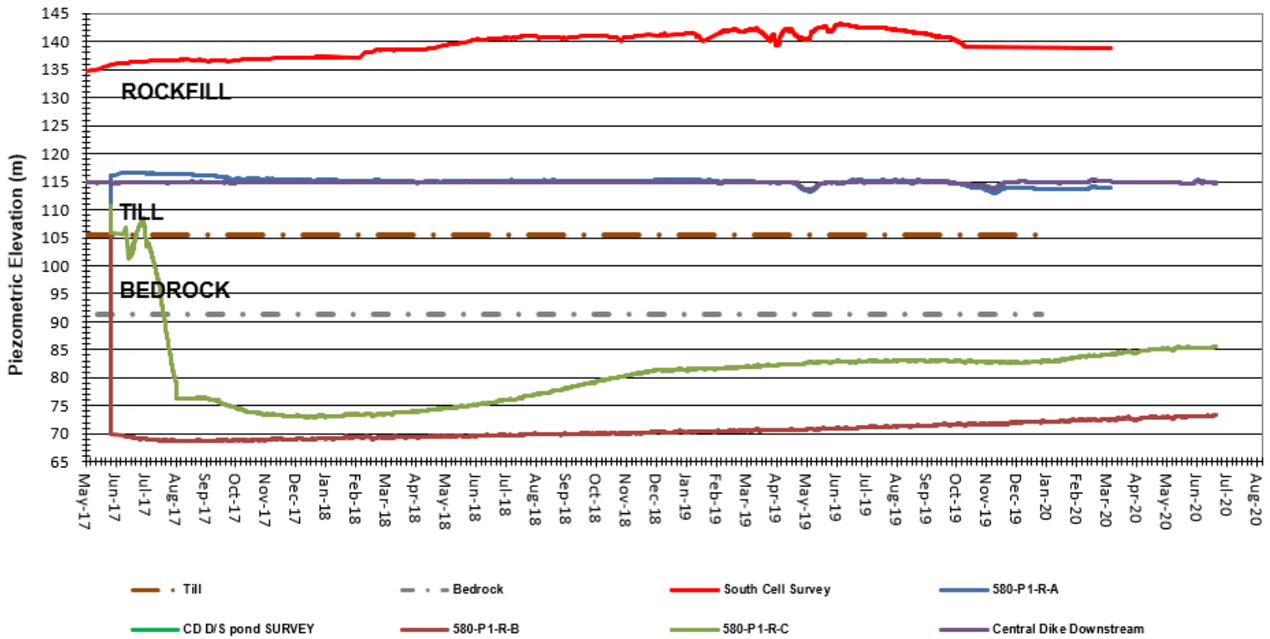
Central Dike – 580 P1 R



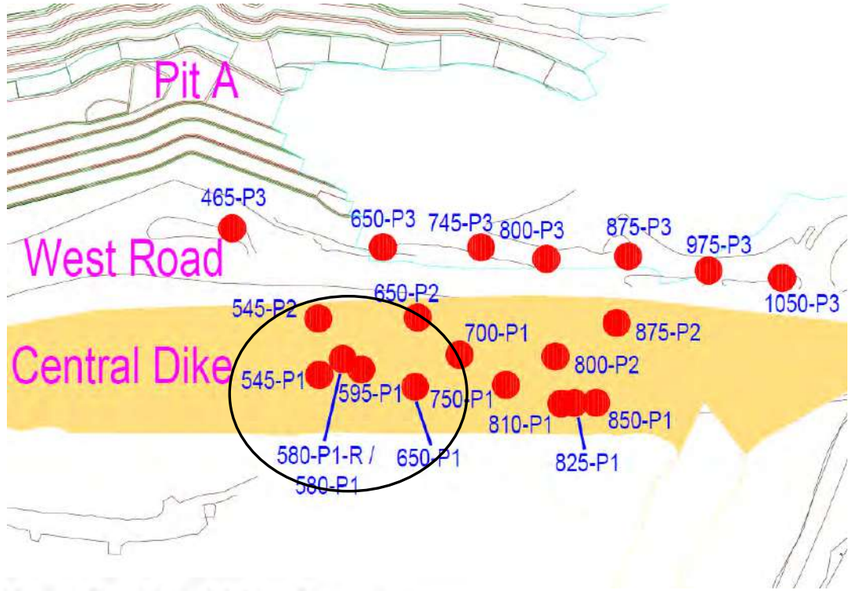
580-P1-R Instrumentation

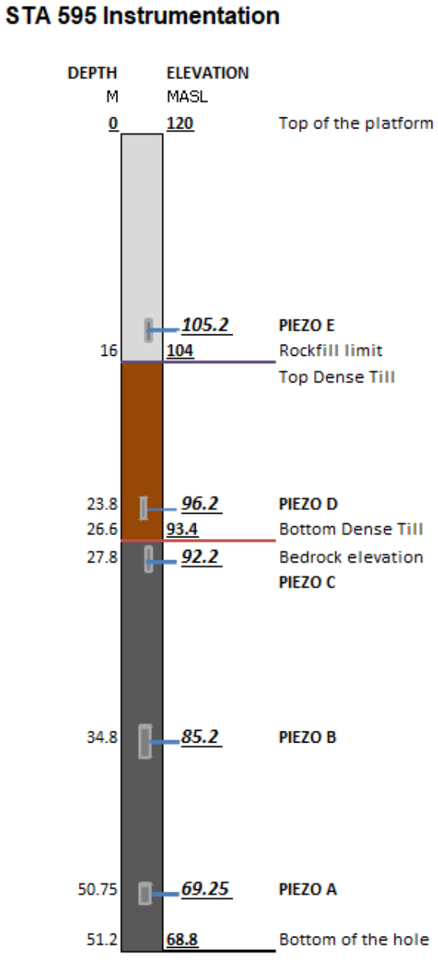


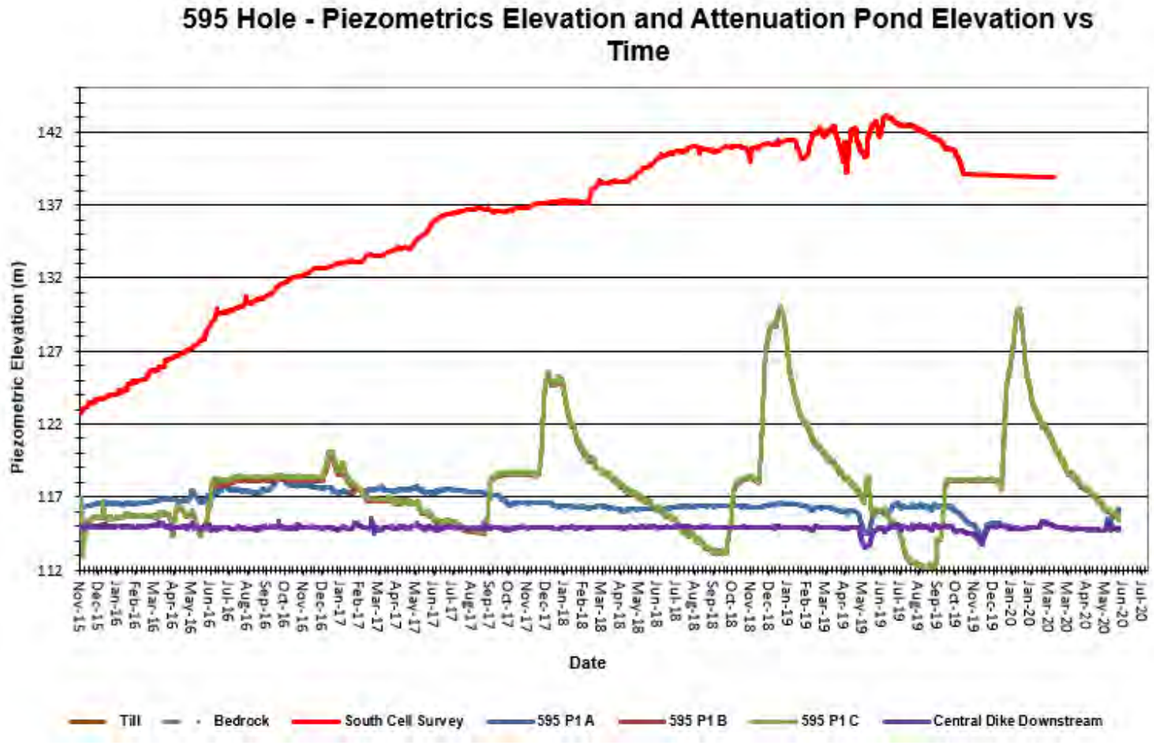
580-P1-R Hole - Piezometrics Elevation and Attenuation Pond Elevation vs Time



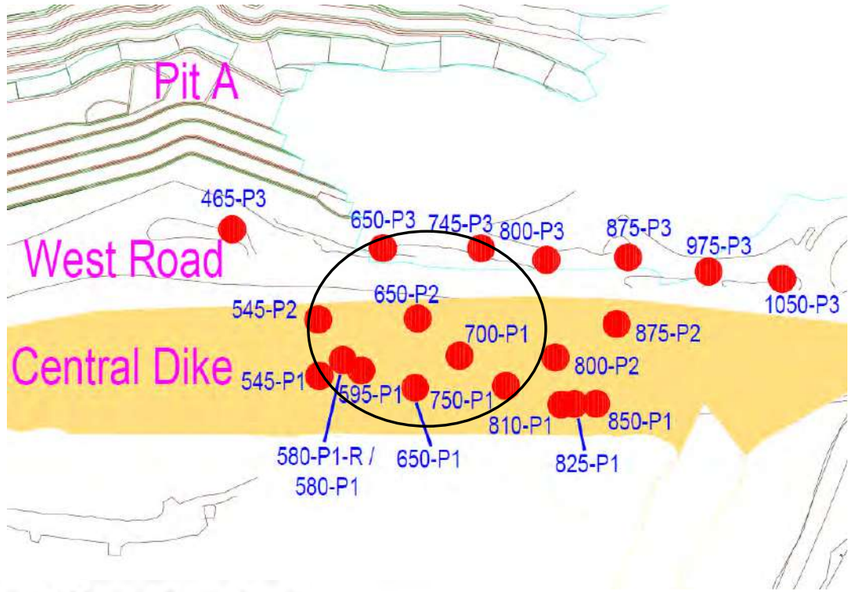
Central Dike – 595 P1

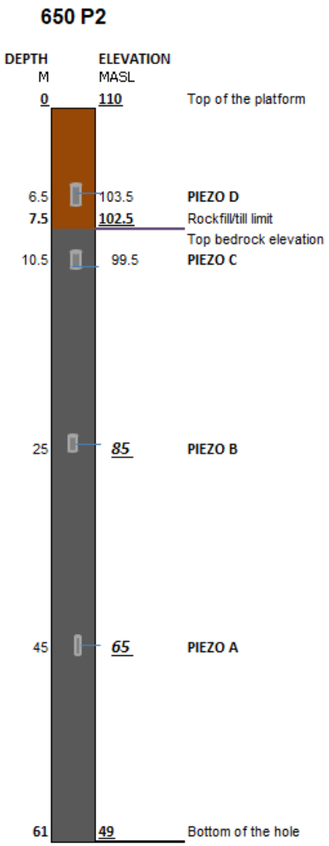


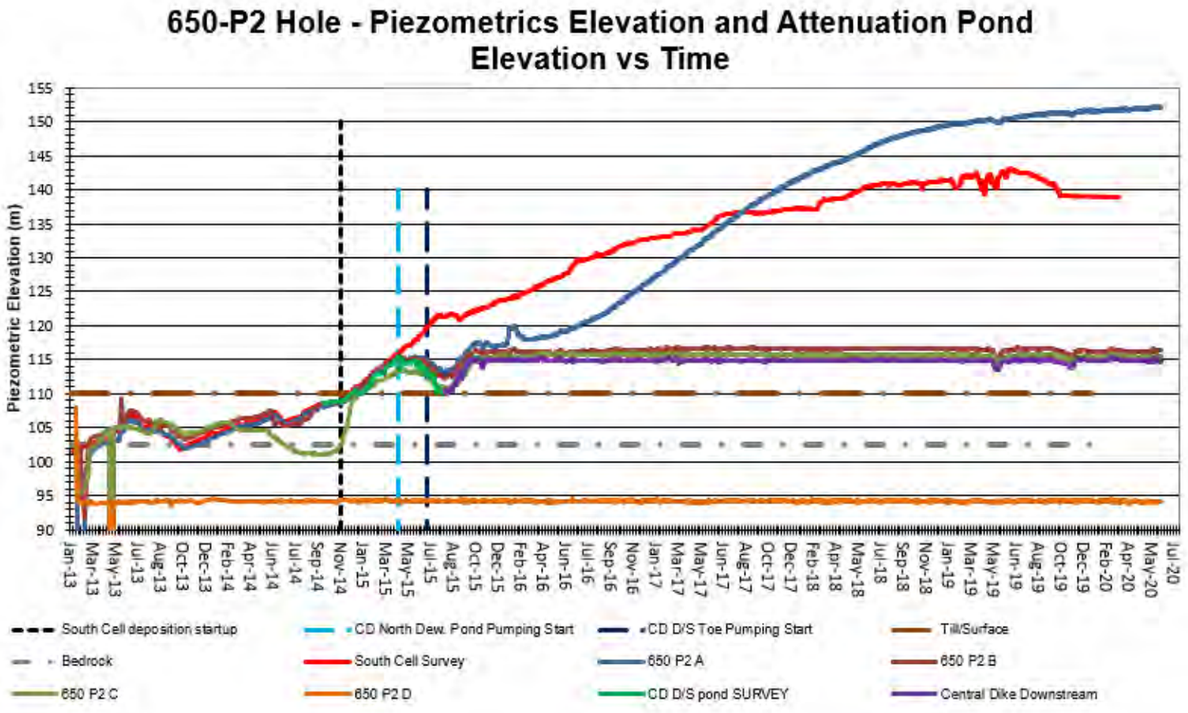




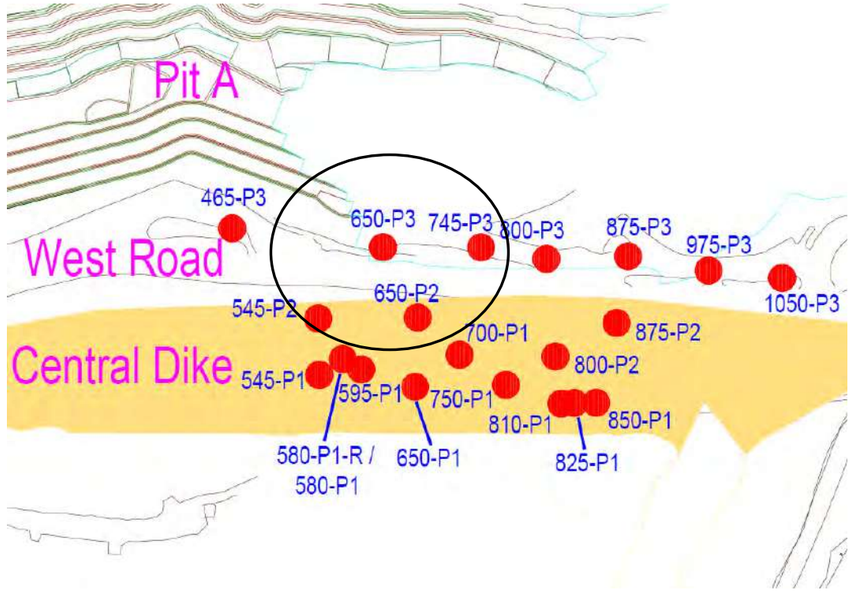
Central Dike – 650 P2

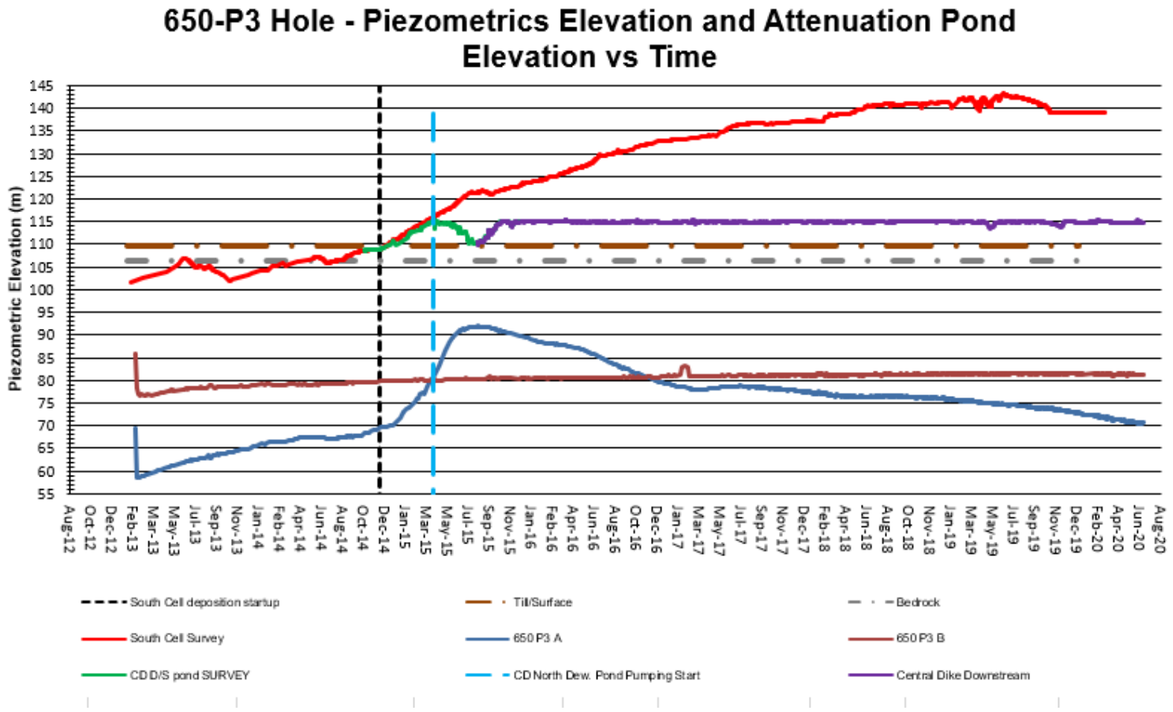


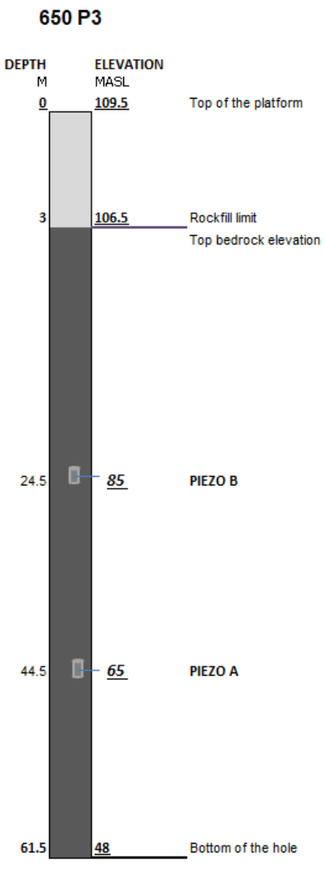




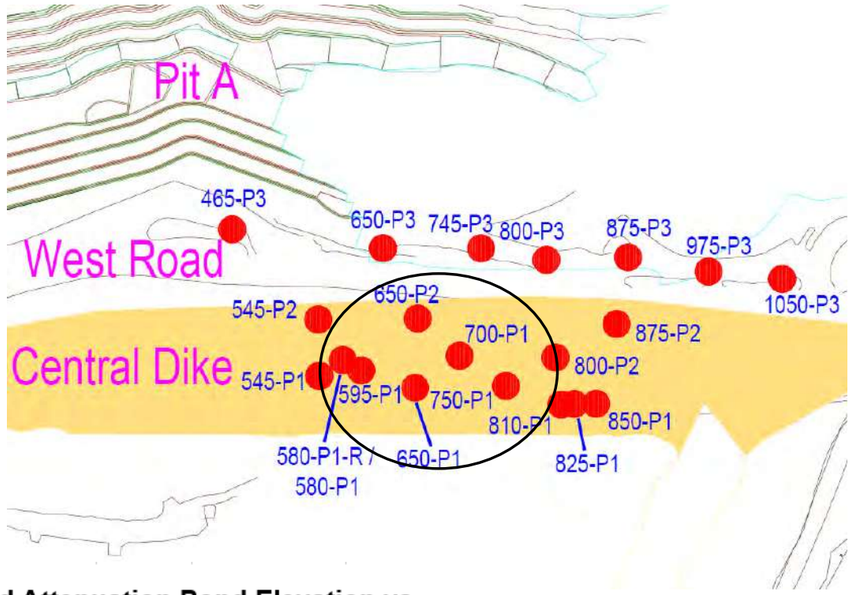
Central Dike – 650 P3

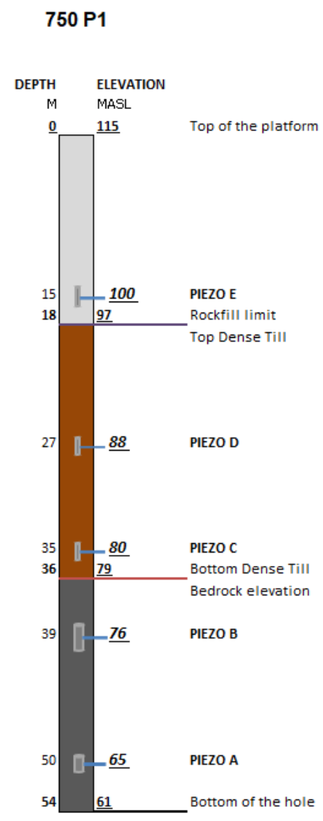


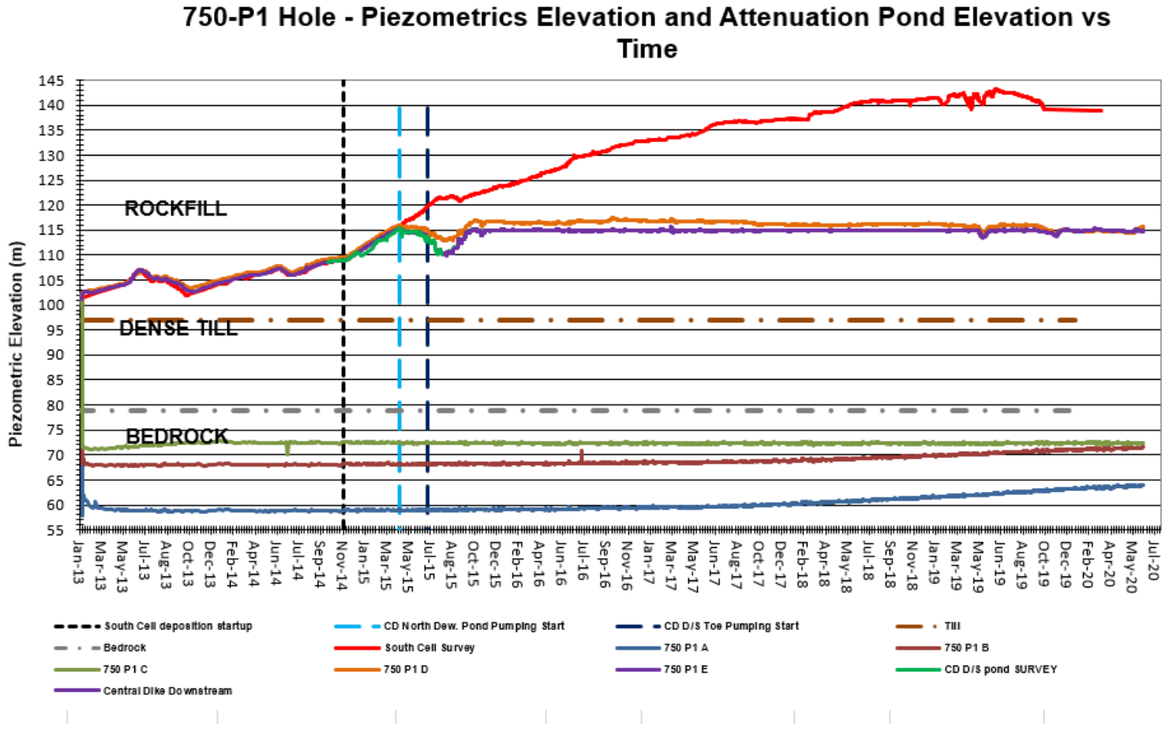




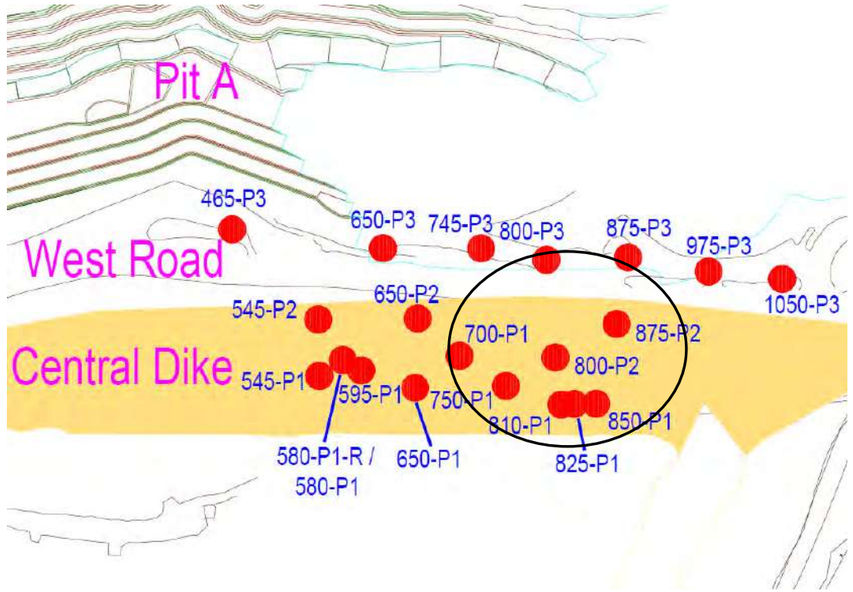
Central Dike – 750 P1



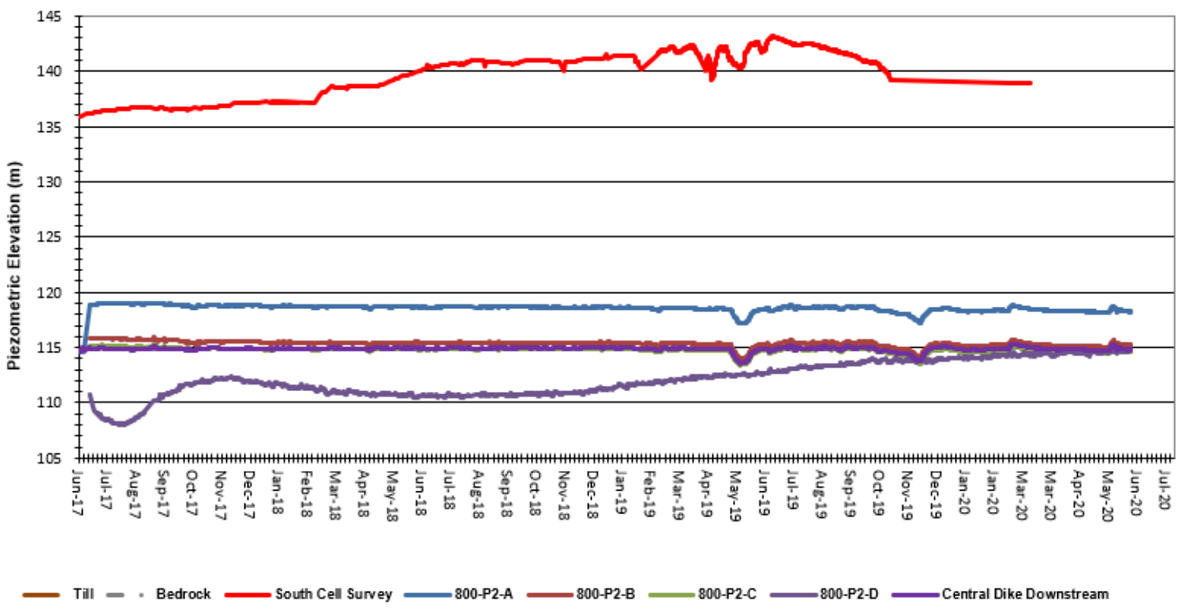




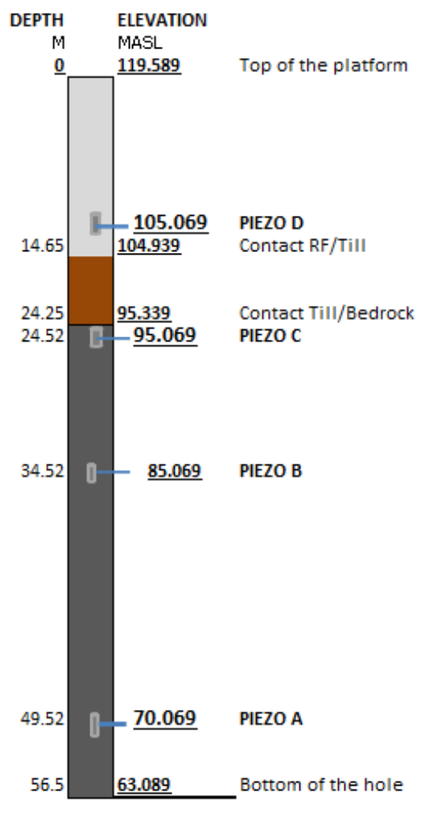
Central Dike – 800 P2



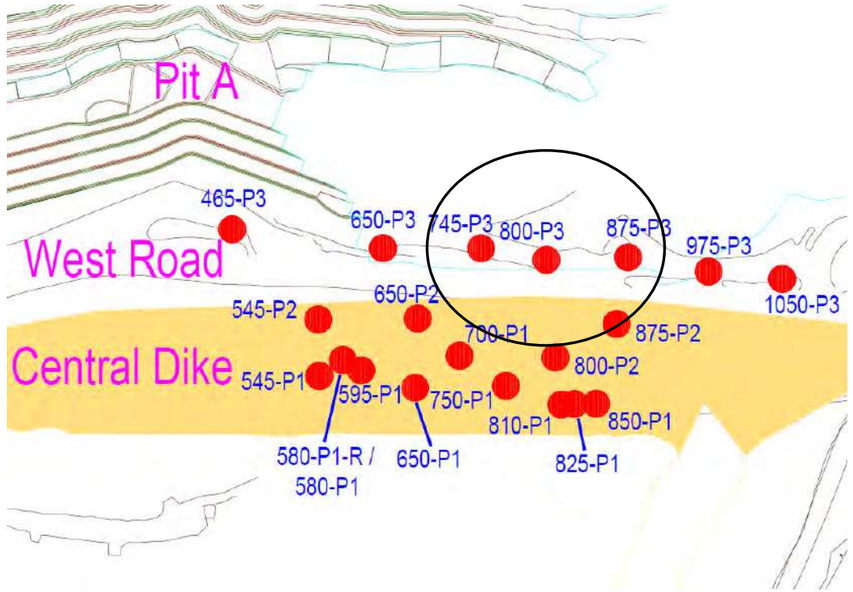
800-P2 Hole - Piezometrics Elevation and Attenuation Pond Elevation vs Time

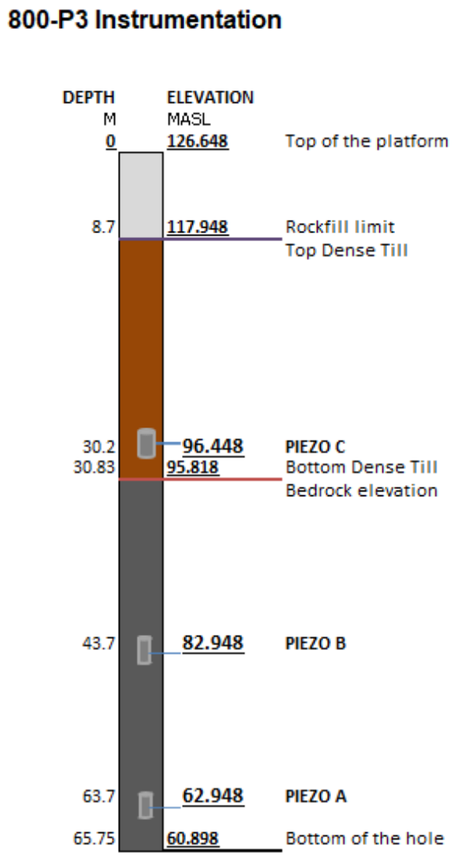


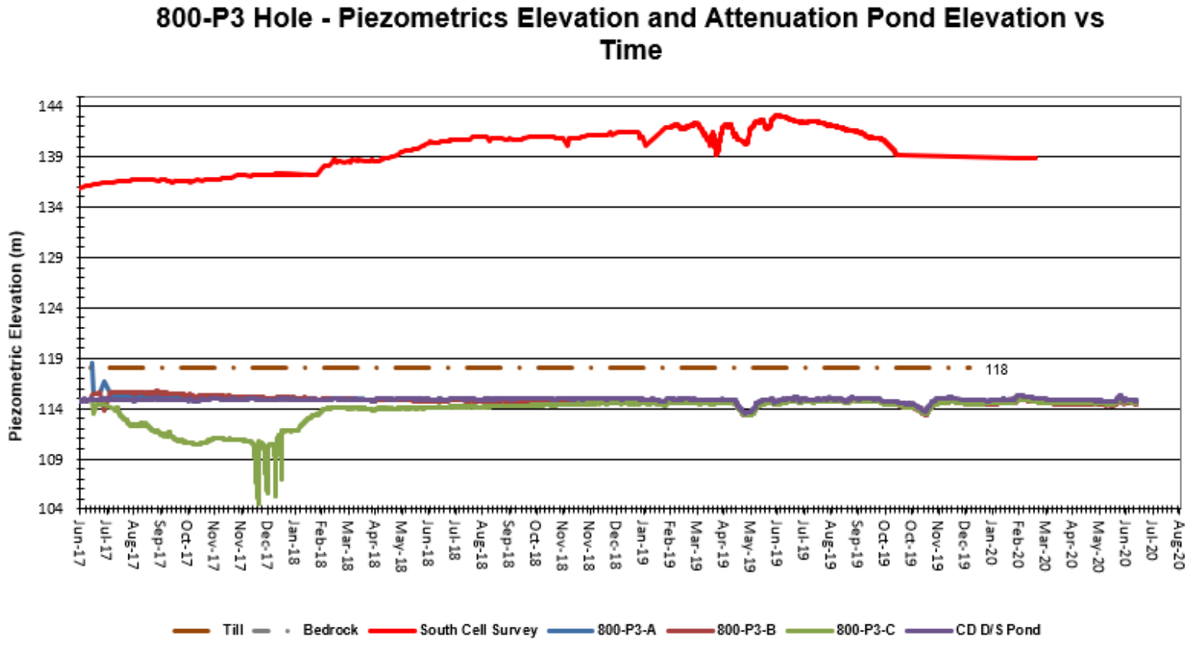
800-P2 Instrumentation



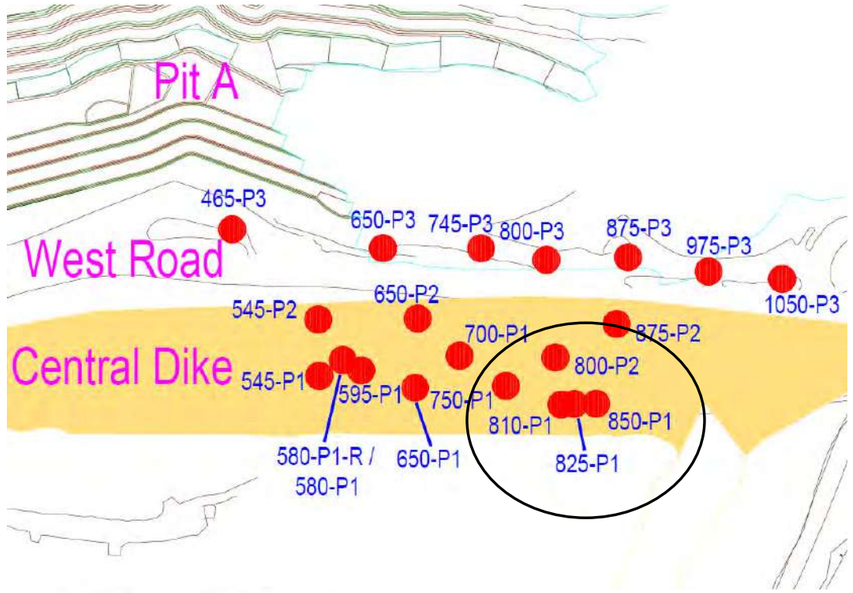
Central Dike – 800 P3

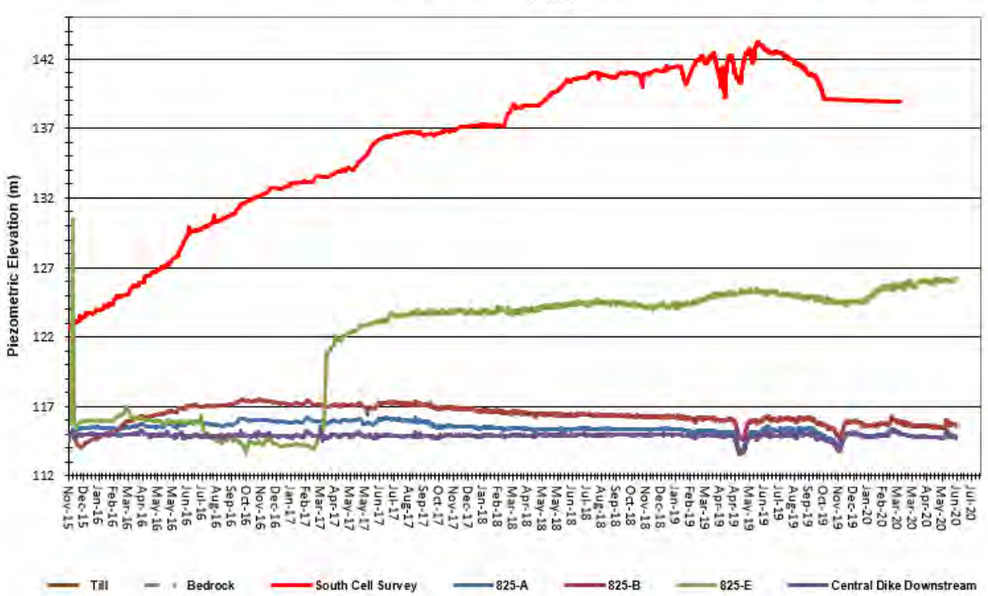


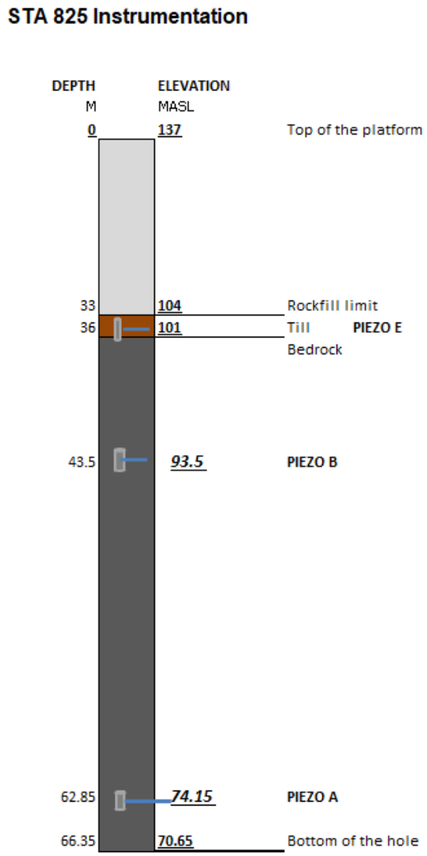




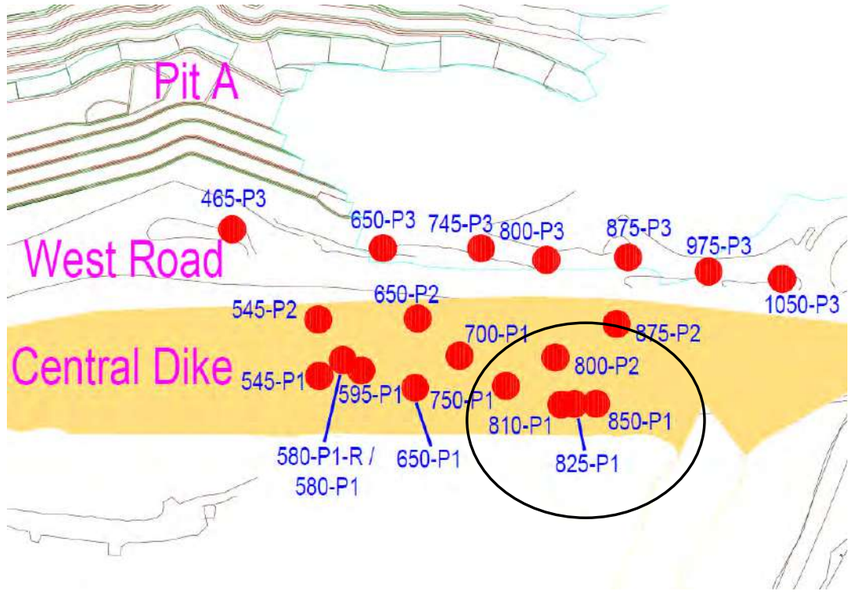
Central Dike – 825 P1

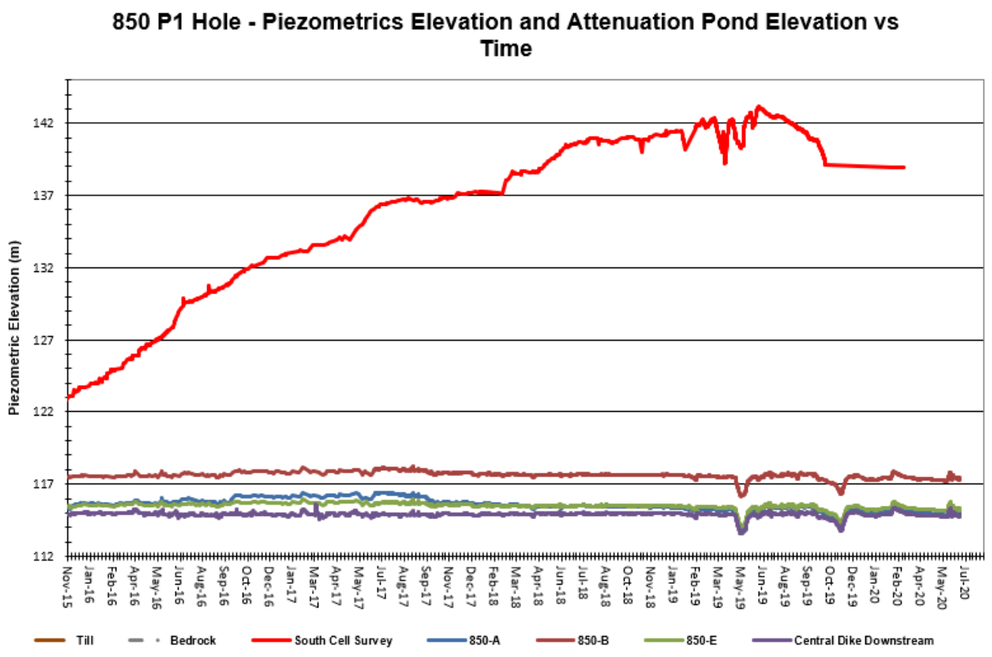


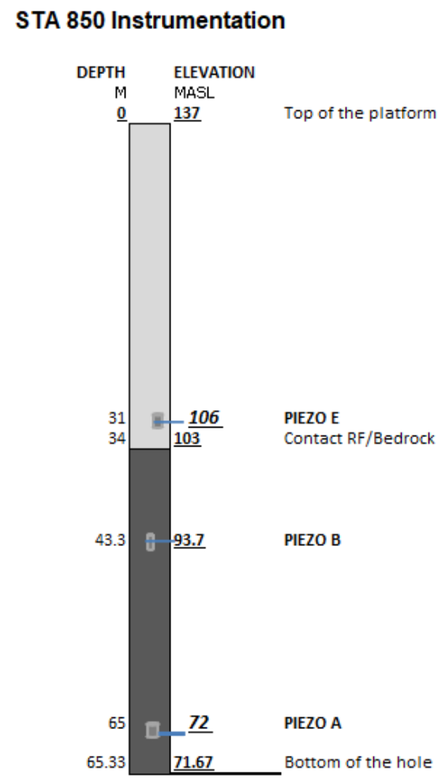




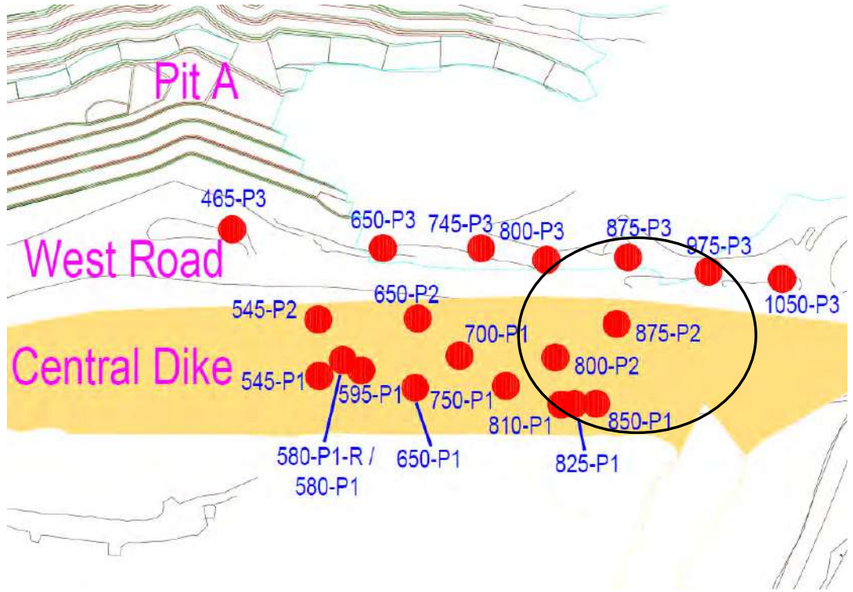
Central Dike – 850 P1



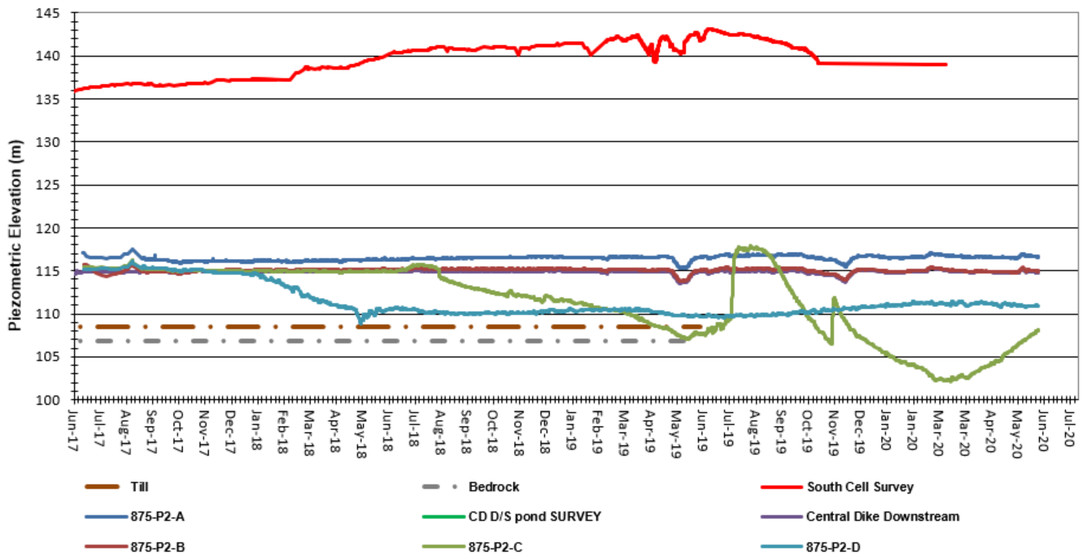




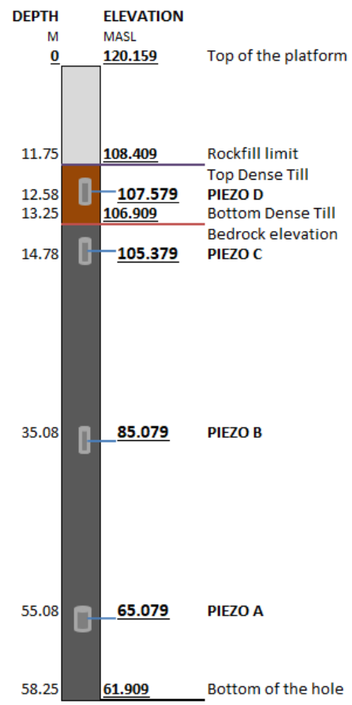
Central Dike – 875 P2



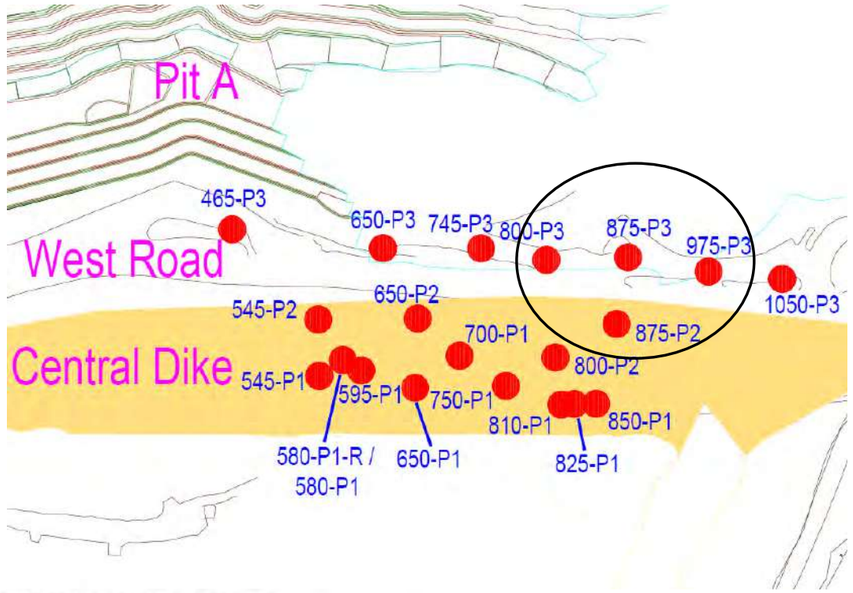
875-P2 Hole - Piezometrics Elevation and Attenuation Pond Elevation vs Time

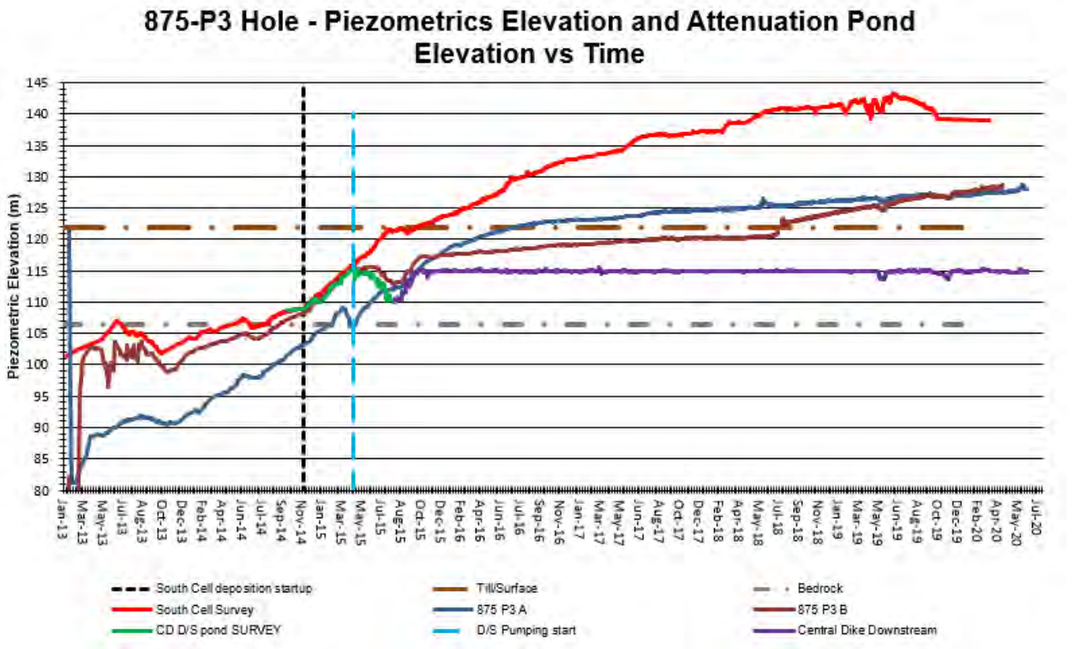


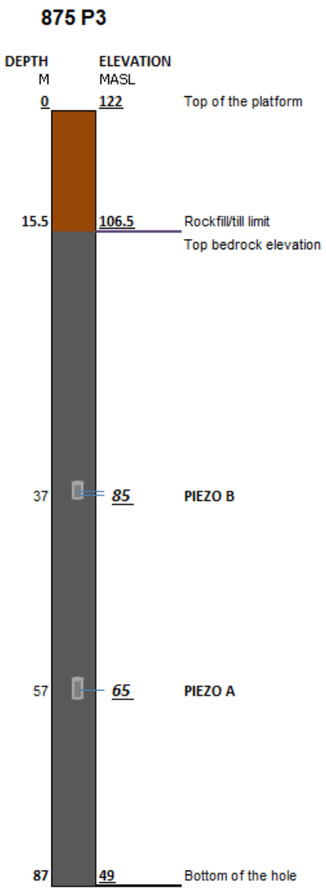
875-P2 Instrumentation



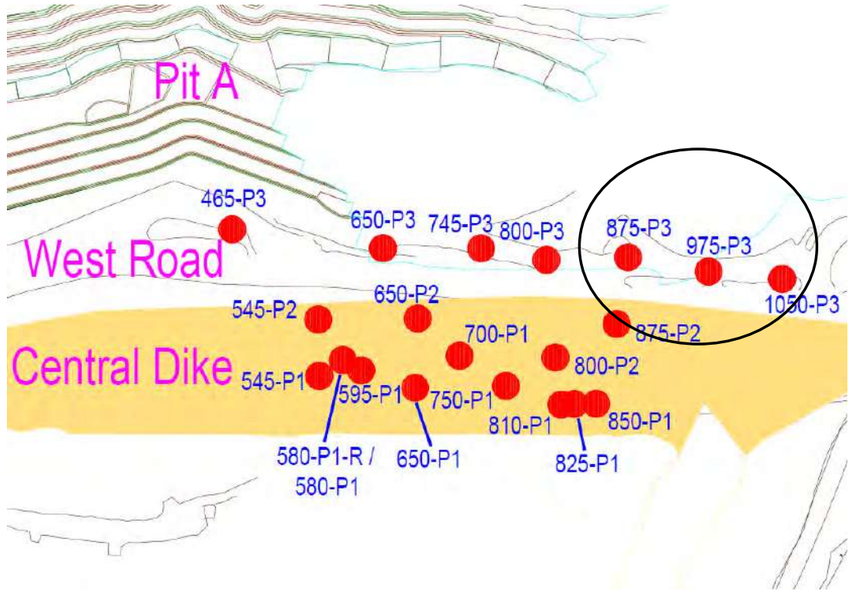
Central Dike – 875 P3



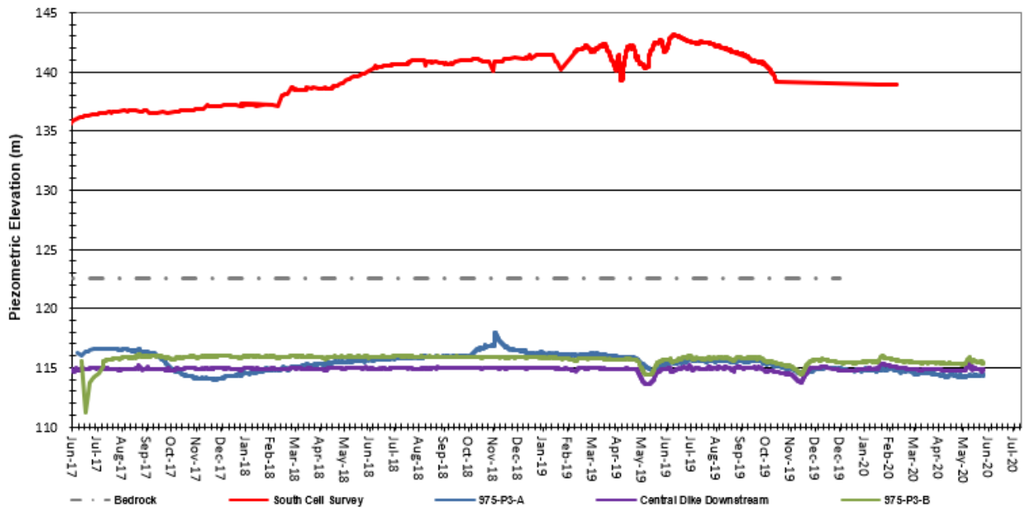




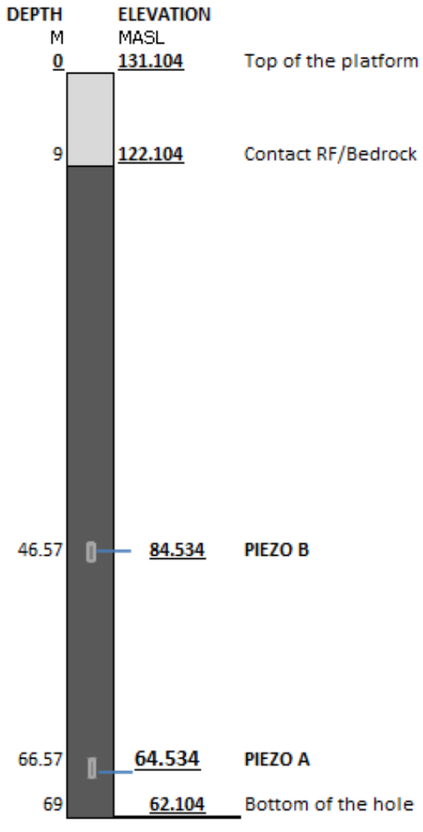
Central Dike – 975 P3



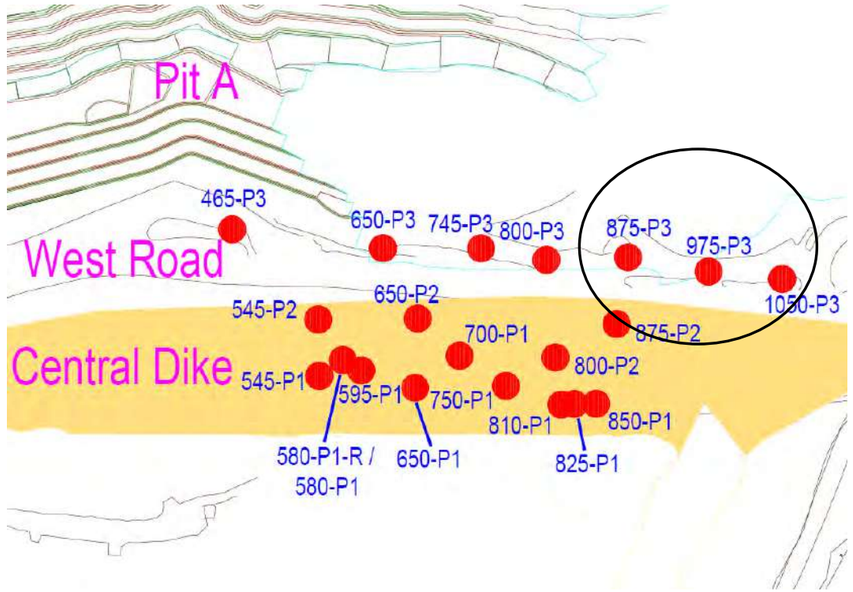
975-P3 Hole - Piezometrics Elevation and Attenuation Pond Elevation vs Time

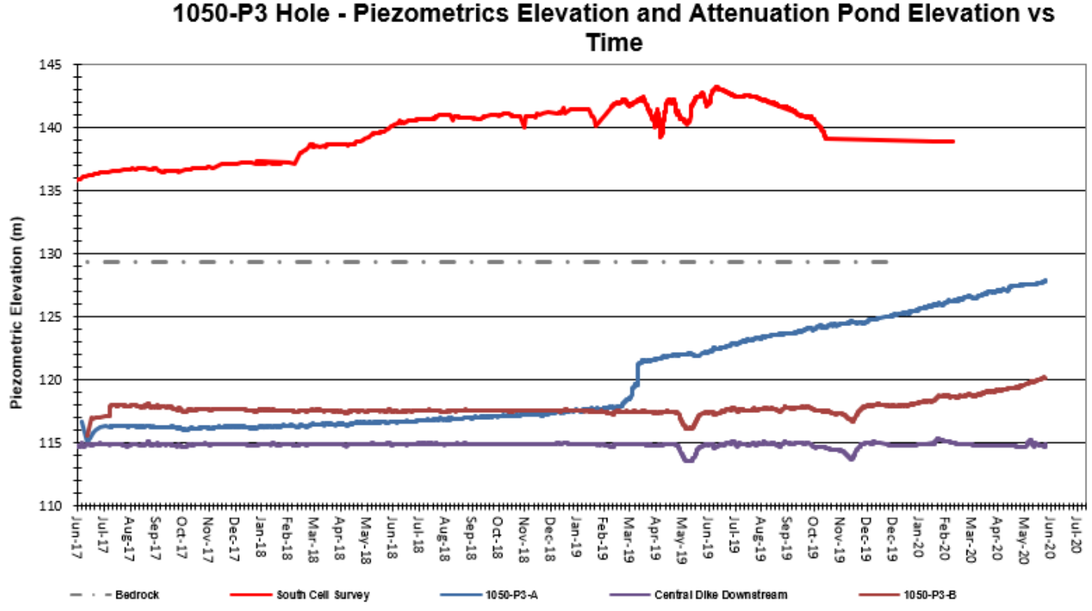


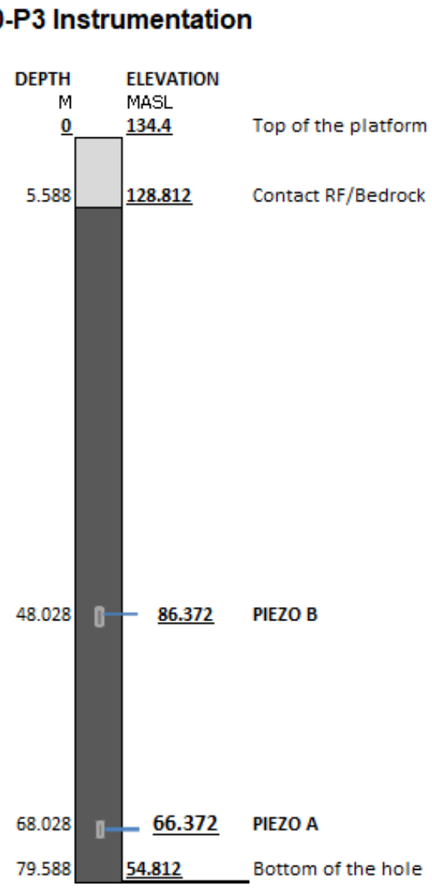
975-P3 Instrumentation



Central Dike – 1050 P3



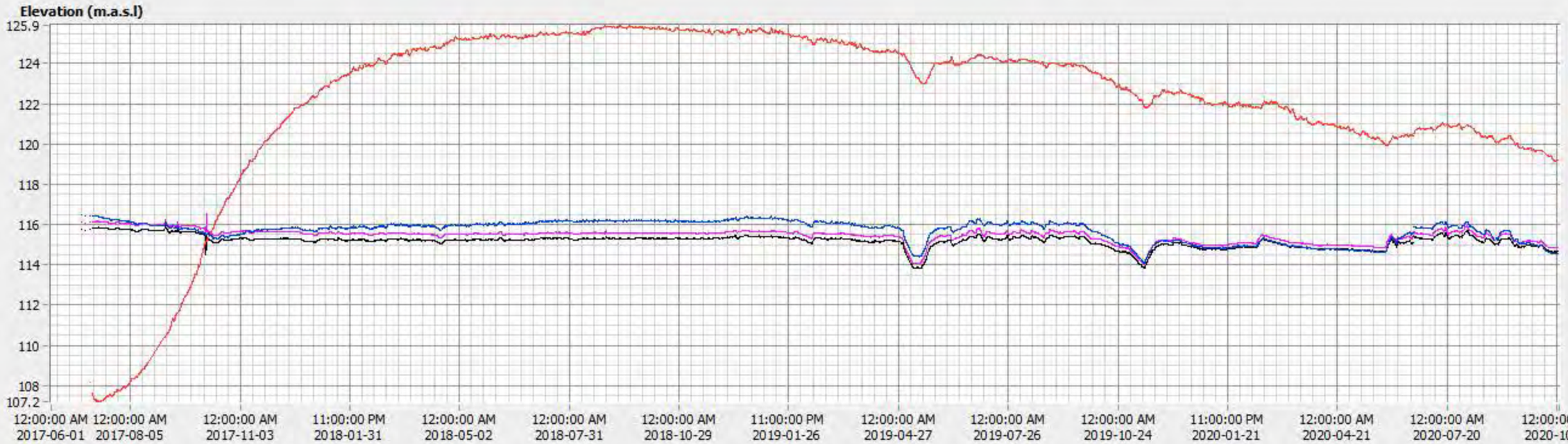




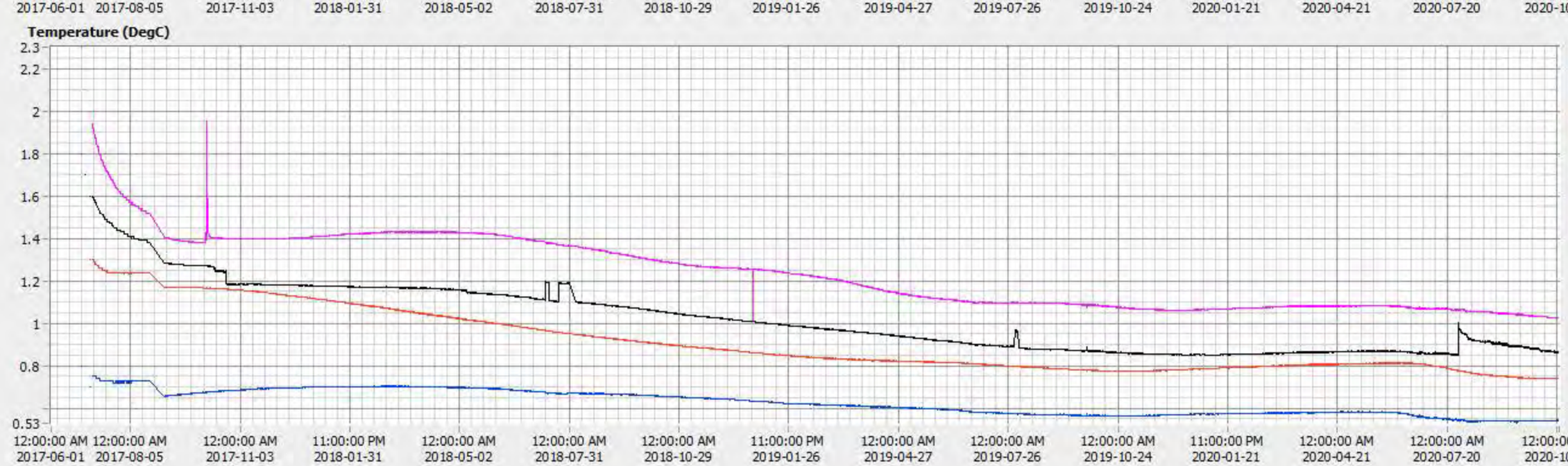
12 - Central Dike: 700_P1

1 month

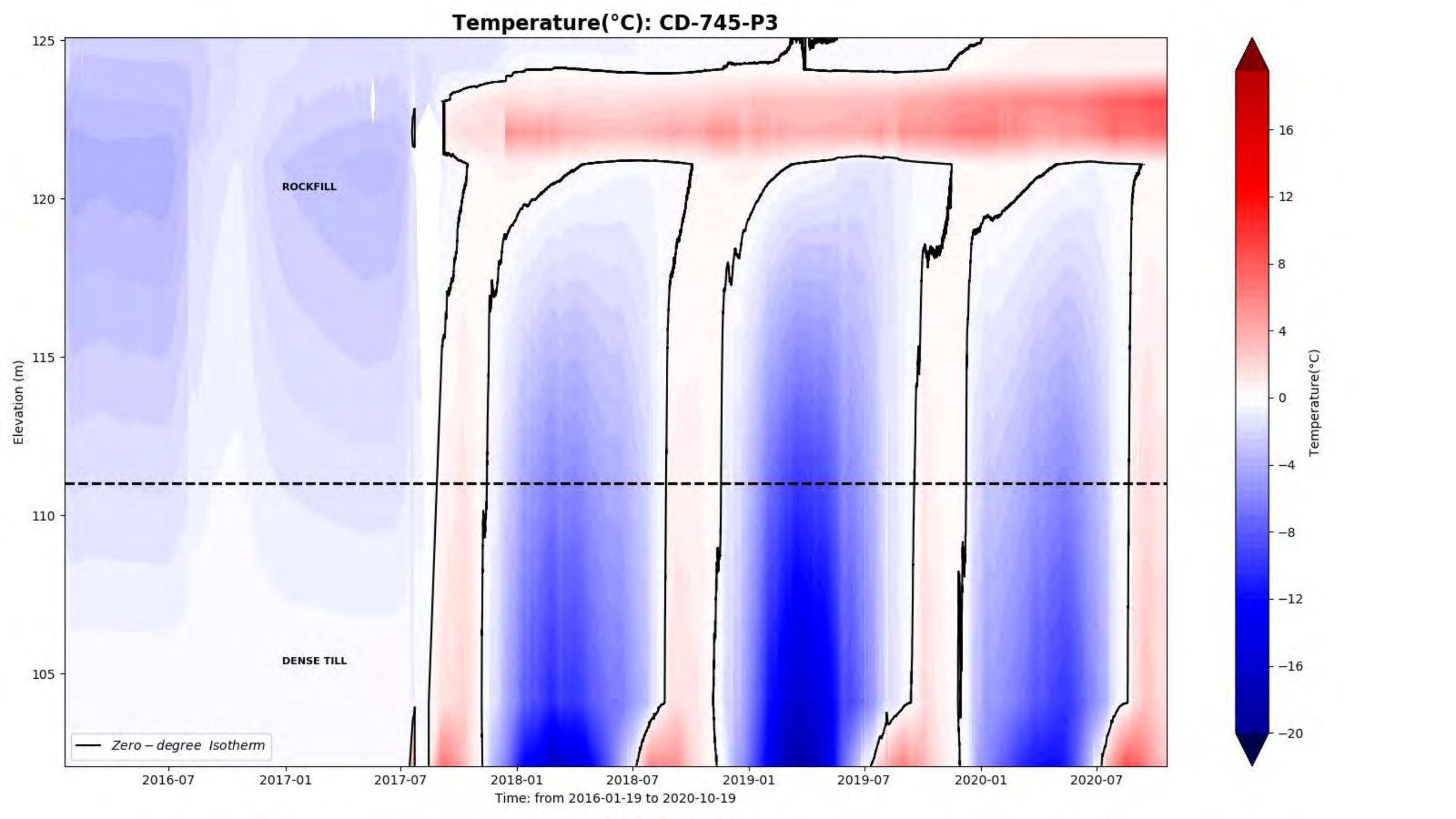
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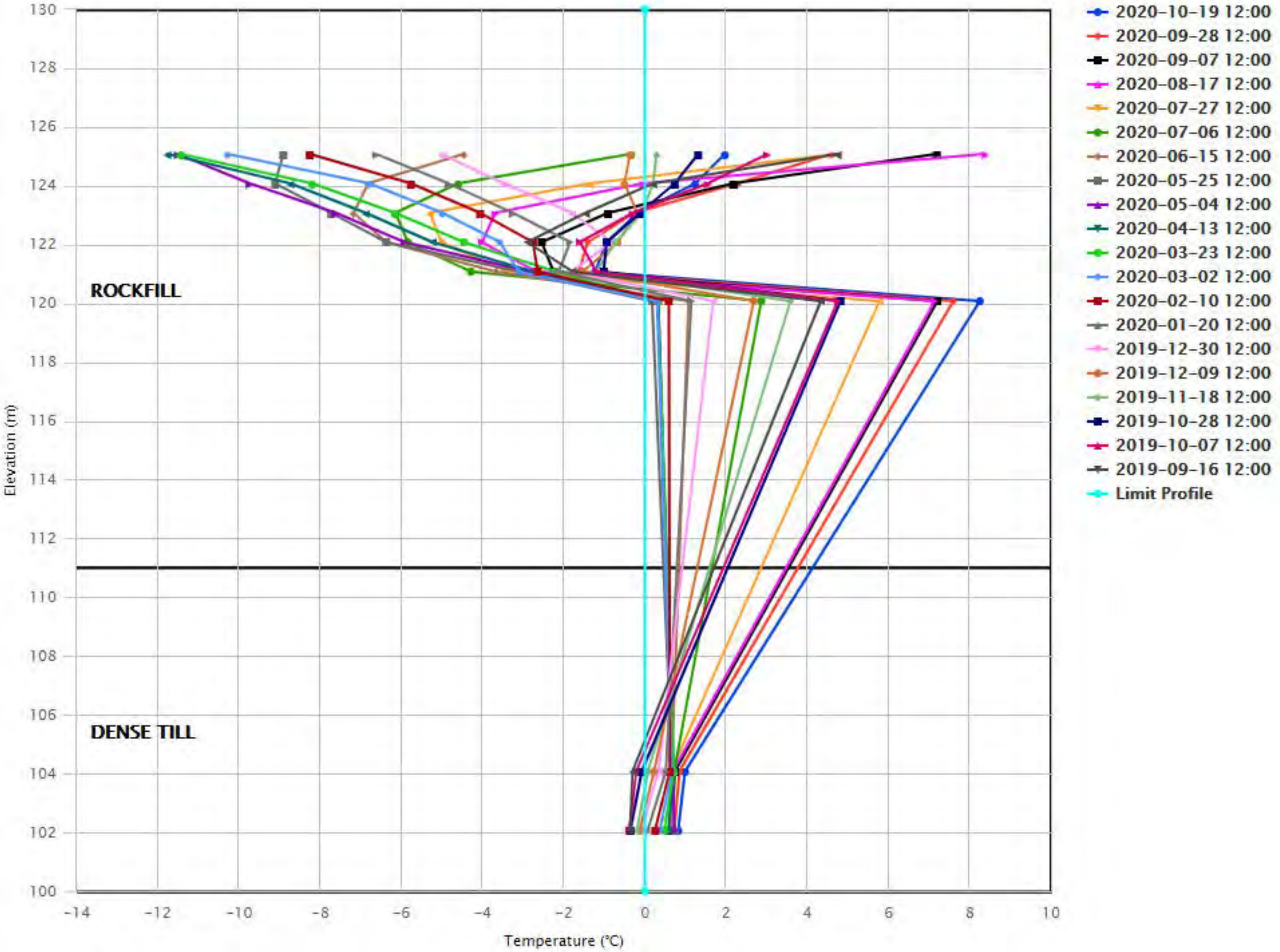
Plot	Latest
700_P1_A_masl: DL11_650_Sys_Pz	114.5
700_P1_B_masl: DL11_650_Sys_Pz	119.2
700_P1_C_masl: DL11_650_Sys_Pz	114.6
700_P1_D_masl: DL11_650_Sys_Pz	114.8



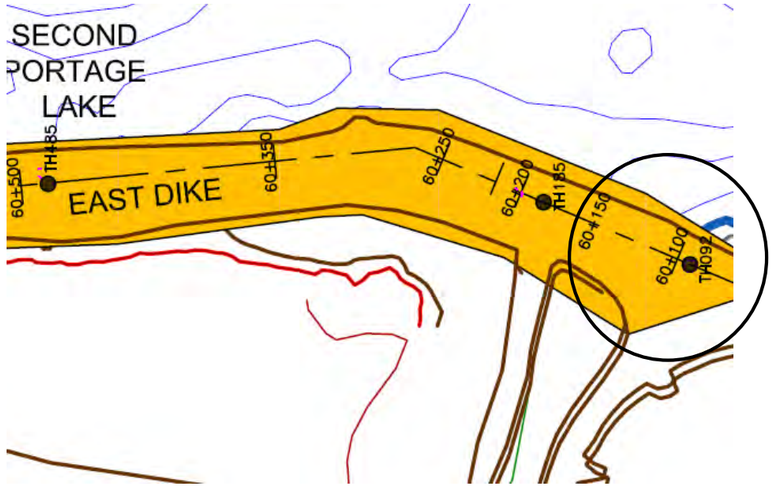
Plot	Latest
PZ_700_P1_A_T: DL11_650_Sys_Pz	0.546
PZ_700_P1_B_T: DL11_650_Sys_Pz	0.743
PZ_700_P1_C_T: DL11_650_Sys_Pz	0.863
PZ_700_P1_D_T: DL11_650_Sys_Pz	1.027

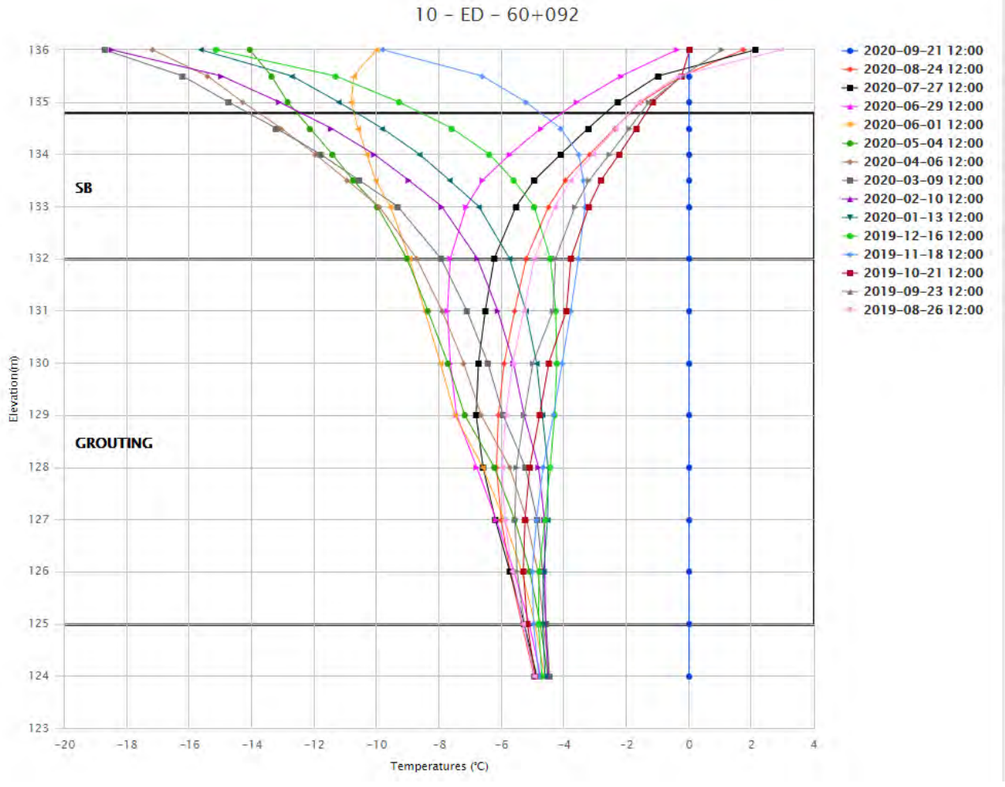

Temperature(°C): CD-745-P3
ROCKFILL
DENSE TILL
Zero – degree Isotherm
Elevation (m)
125
120
115
110
105
2016-07
2017-01
2017-07
2018-01
2018-07
2019-01
2019-07
2020-01
2020-07
Time: from 2016-01-19 to 2020-10-19
16
12
8
4
0
−4
−8
−12
−16
−20
Temperature(°C)

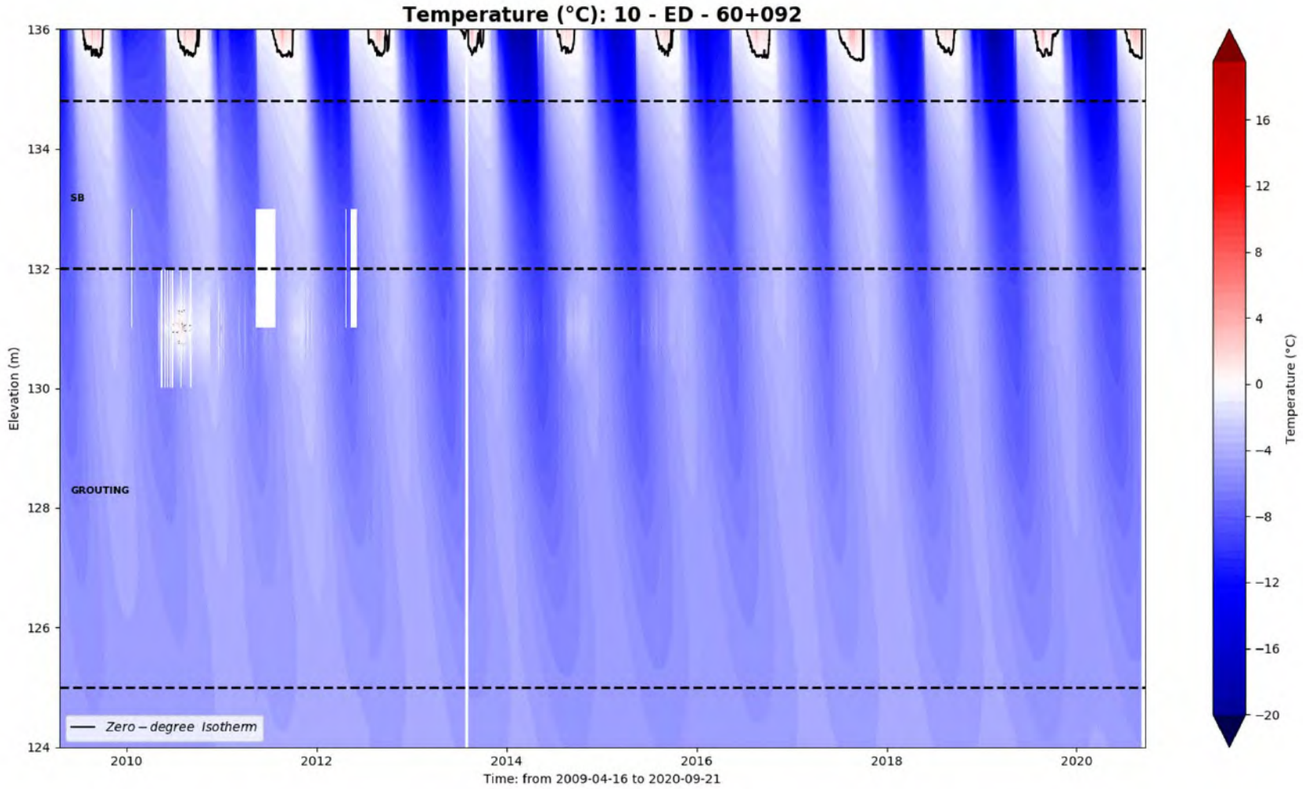
12 – CD – 745 – P3

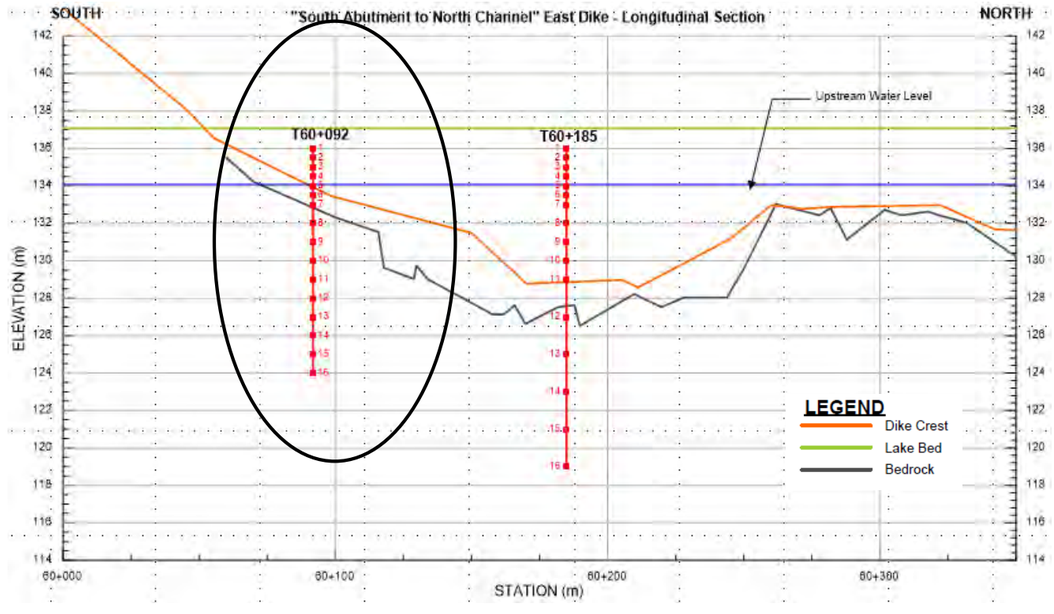

ROCKFILL
DENSE TILL
Elevation (m)
130
128
126
124
122
120
118
116
114
112
110
108
106
104
102
100
-14
-12
-10
-8
-6
-4
-2
0
2
4
6
8
10
Temperature (°C)
2020-10-19 12:00
2020-09-28 12:00
2020-09-07 12:00
2020-08-17 12:00
2020-07-27 12:00
2020-07-06 12:00
2020-06-15 12:00
2020-05-25 12:00
2020-05-04 12:00
2020-04-13 12:00
2020-03-23 12:00
2020-03-02 12:00
2020-02-10 12:00
2020-01-20 12:00
2019-12-30 12:00
2019-12-09 12:00
2019-11-18 12:00
2019-10-28 12:00
2019-10-07 12:00
2019-09-16 12:00
Limit Profile

East Dike TH 60+092

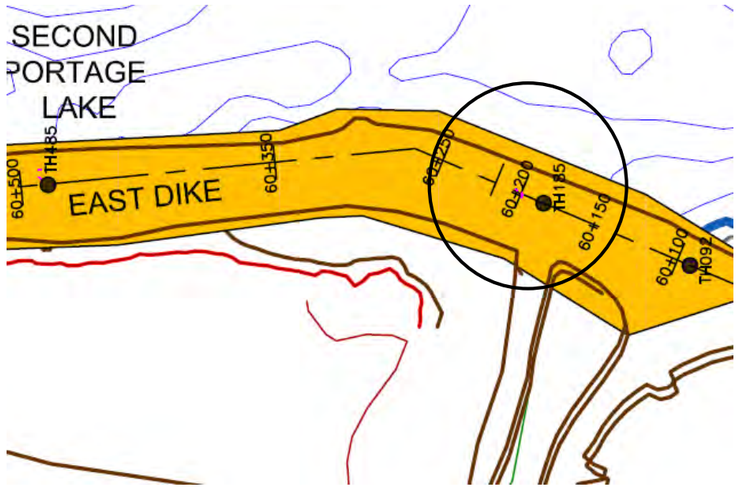


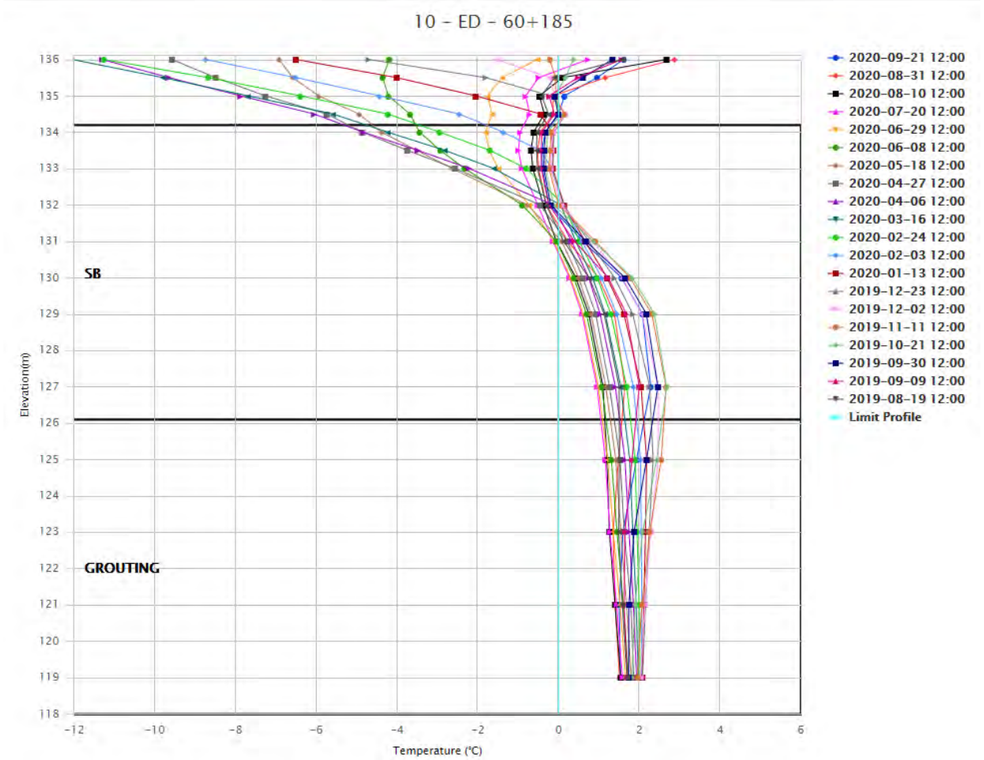


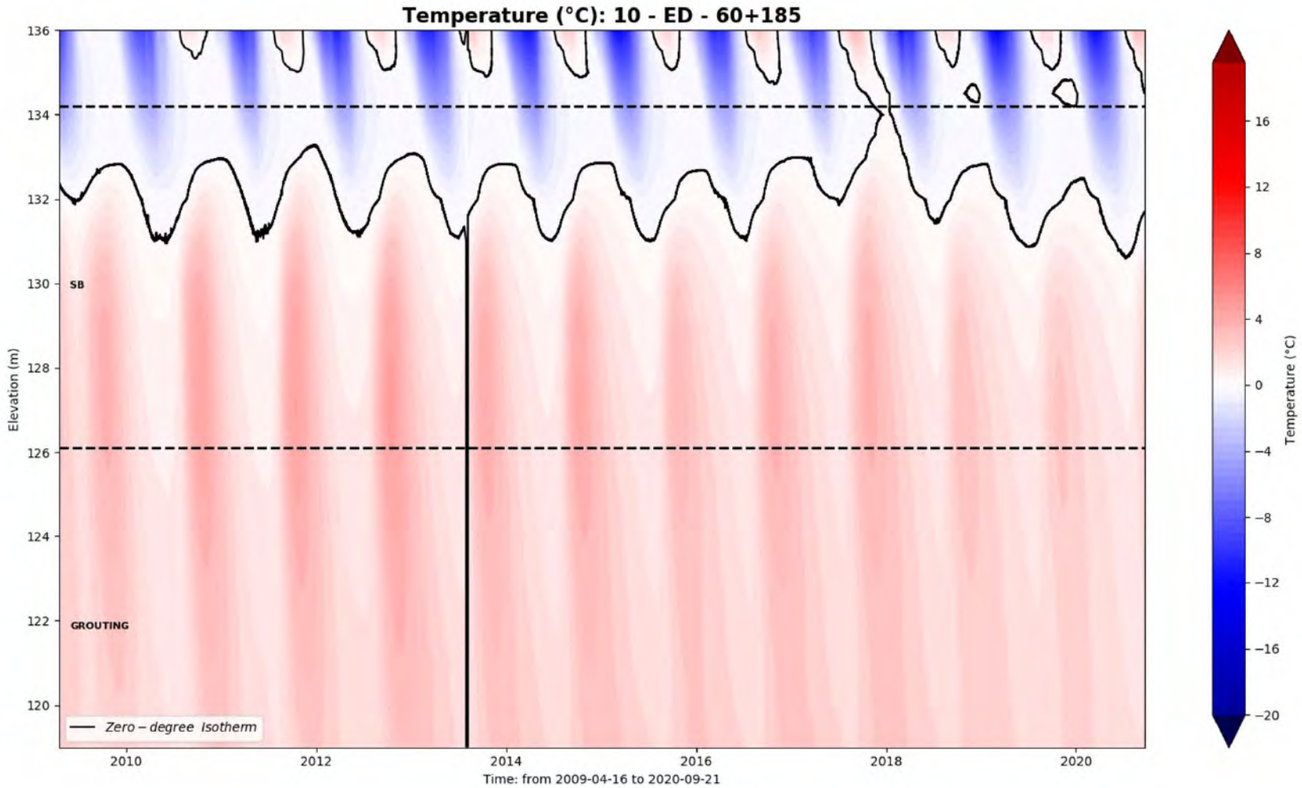


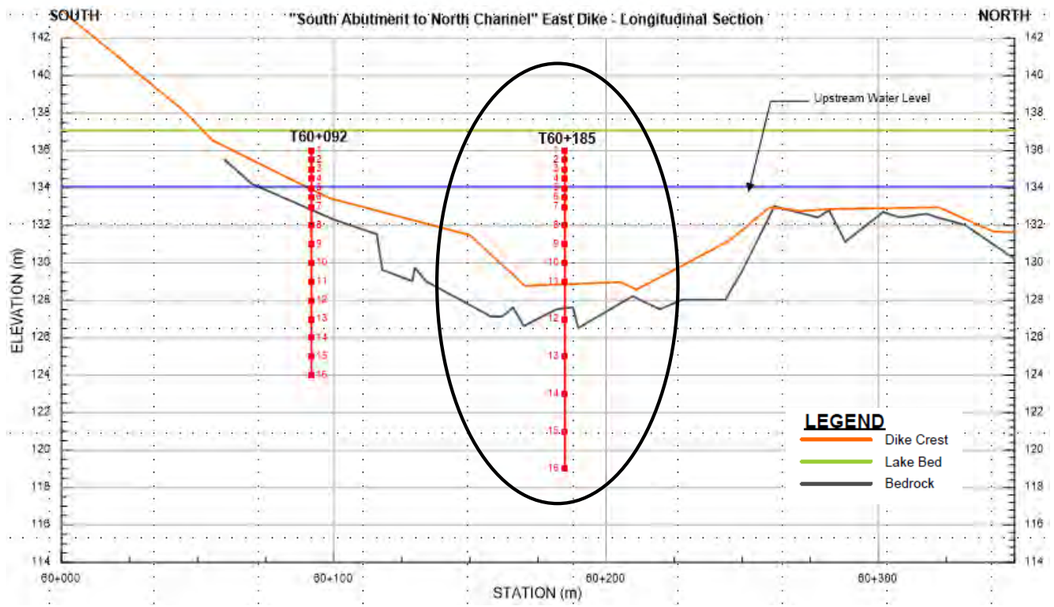


East Dike TH 60+185

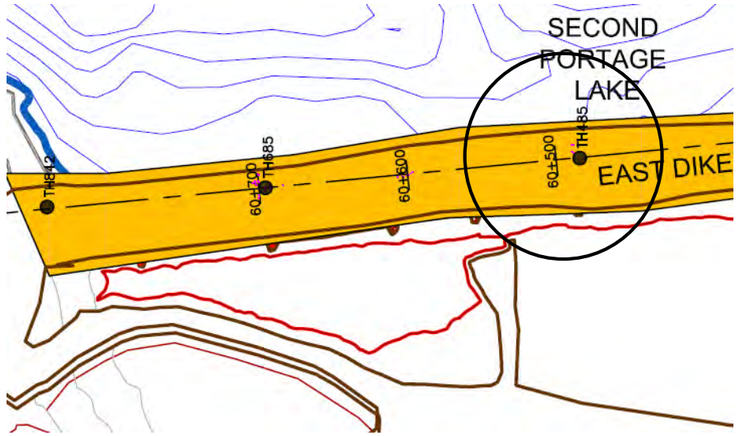


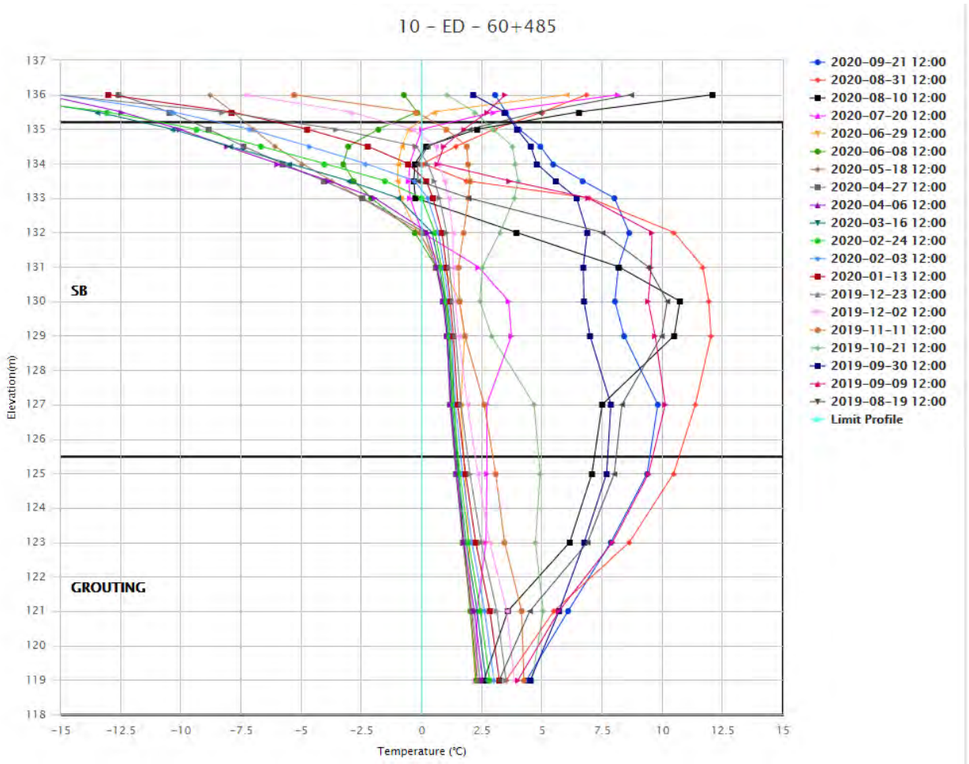


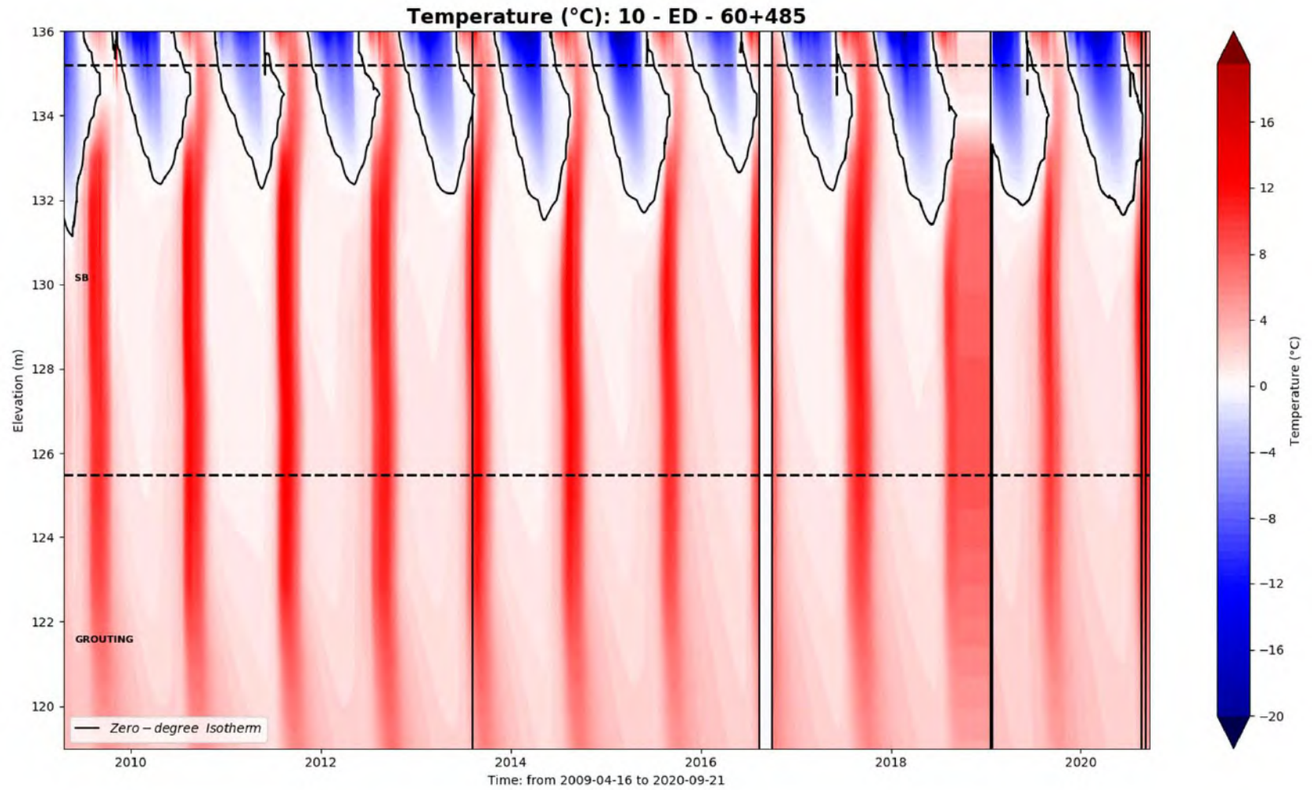


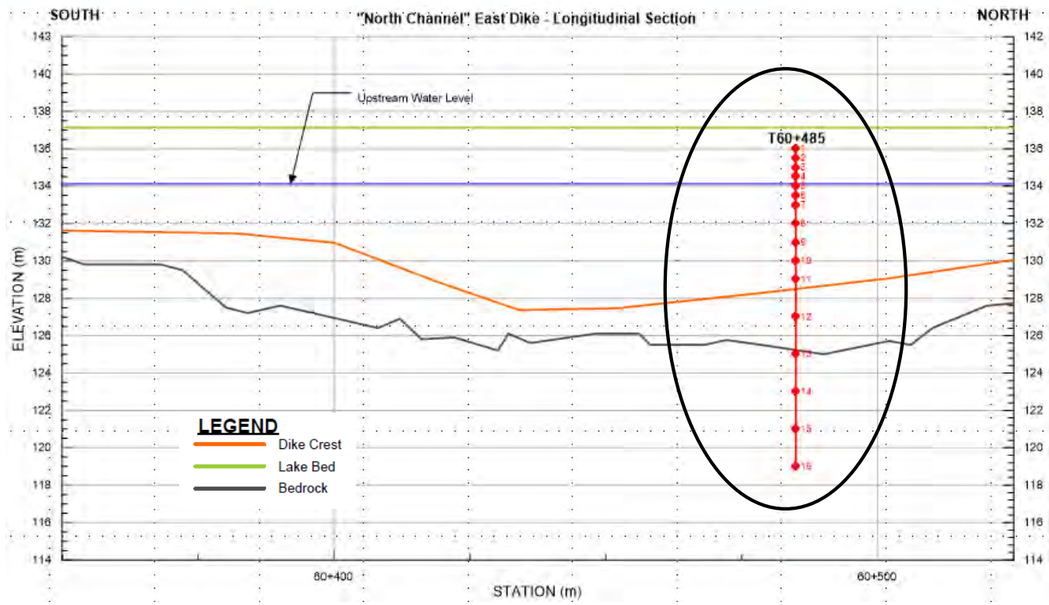


East Dike TH 60+485

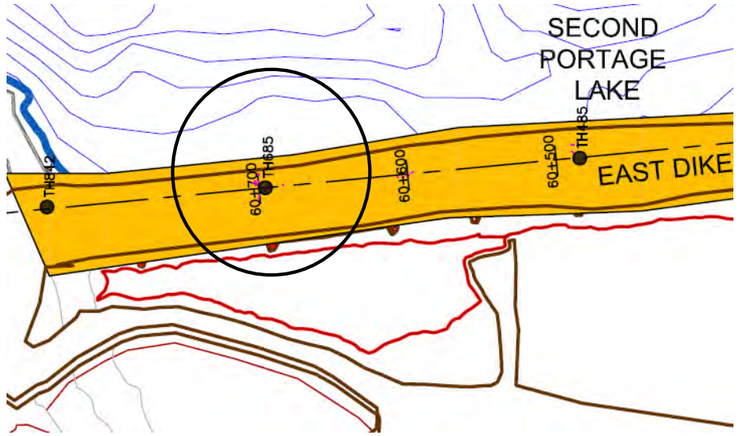


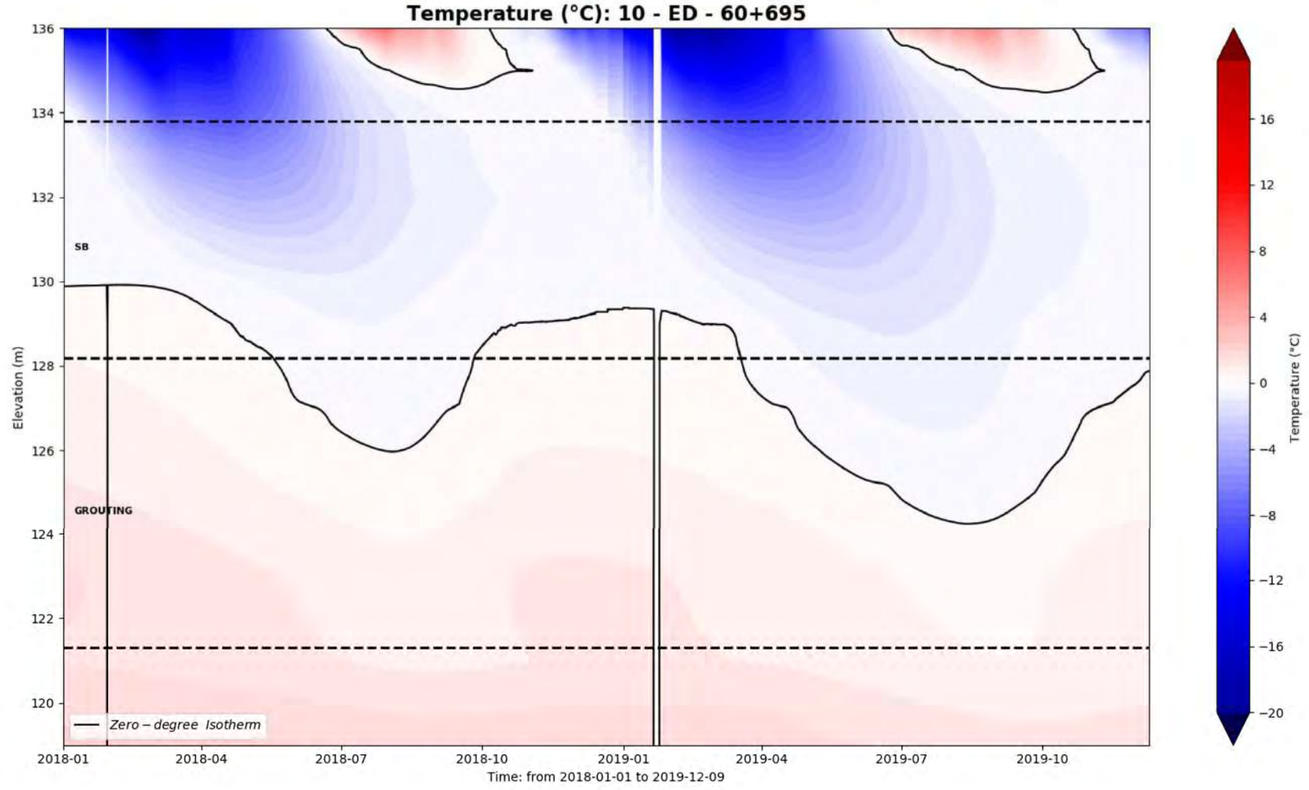


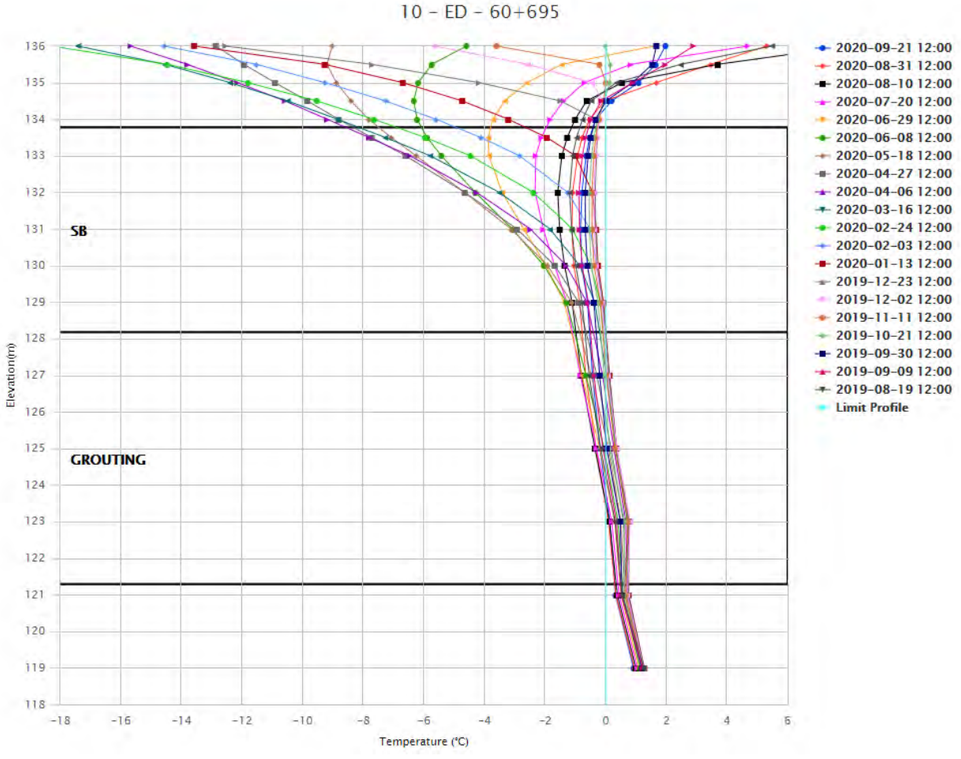


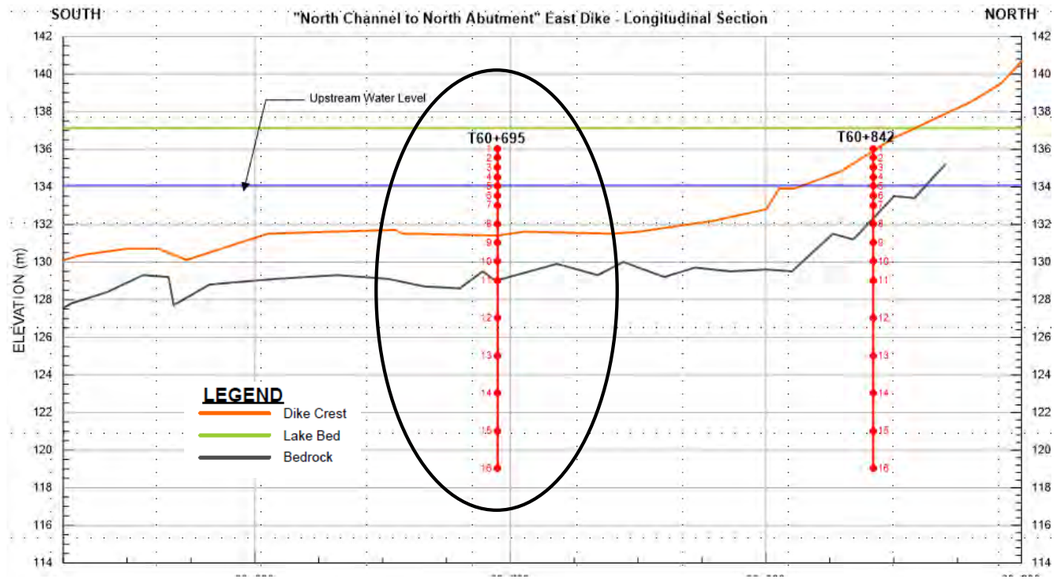


East Dike TH 60+695

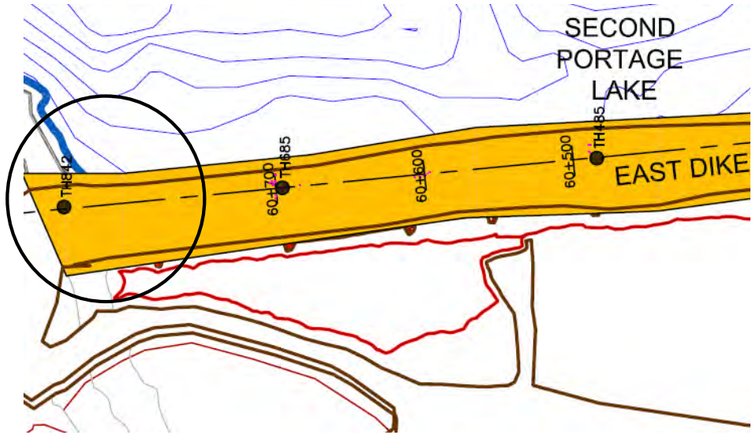


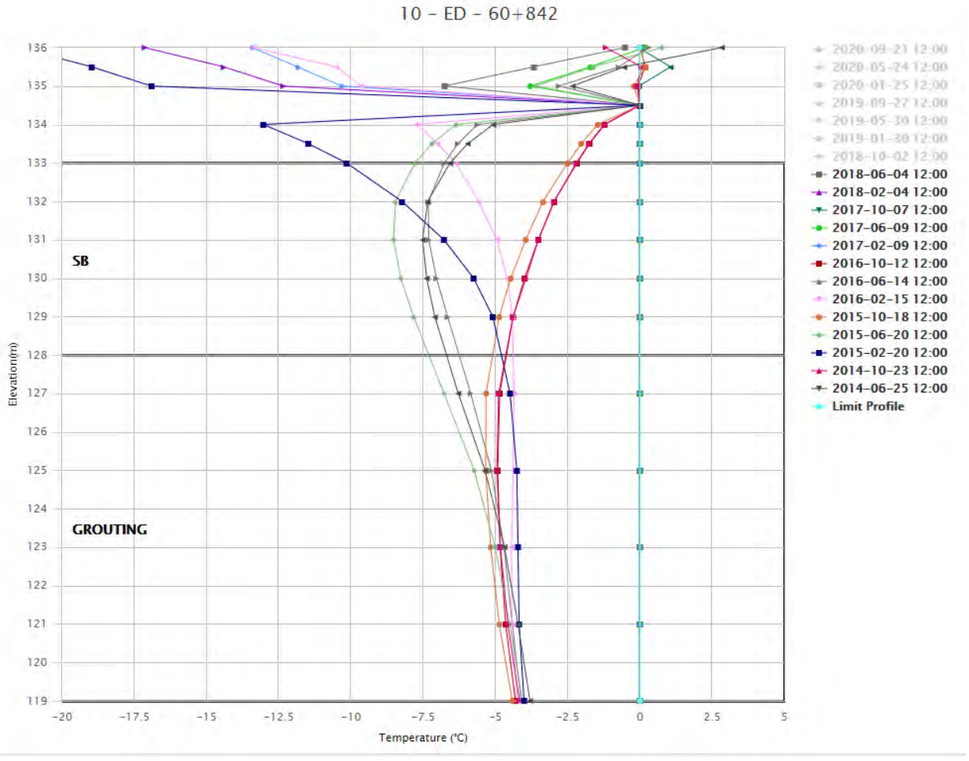


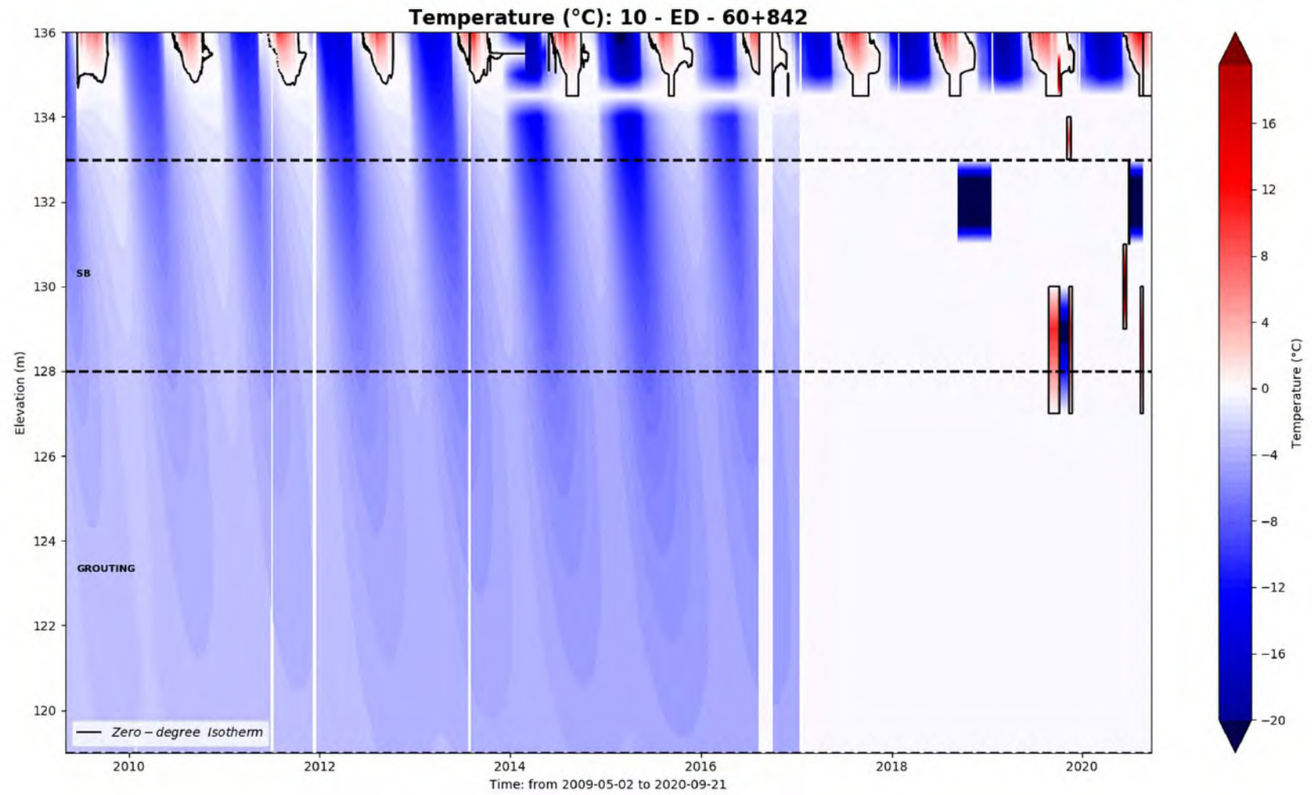


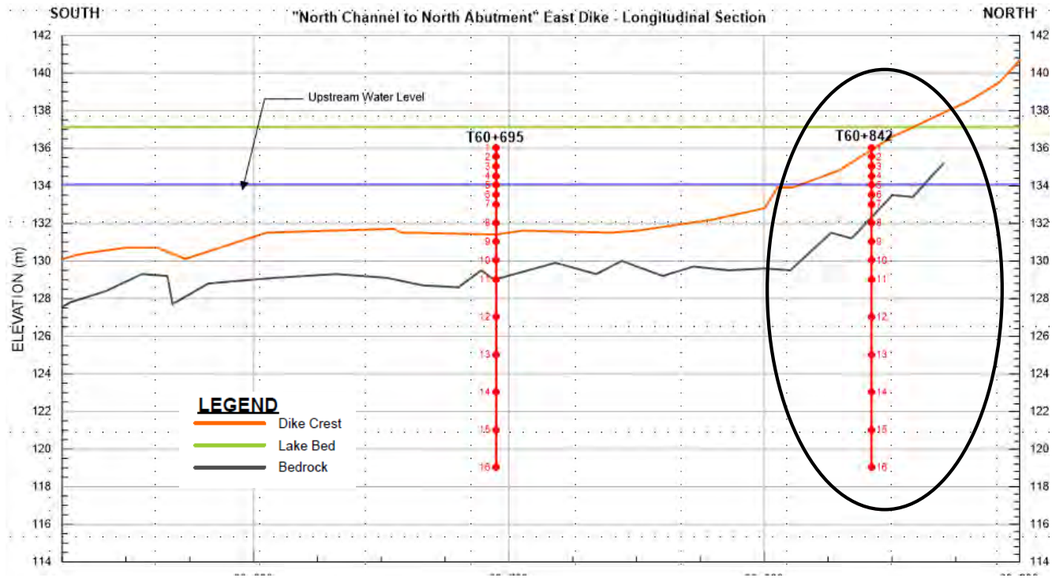


East Dike TH 60+842

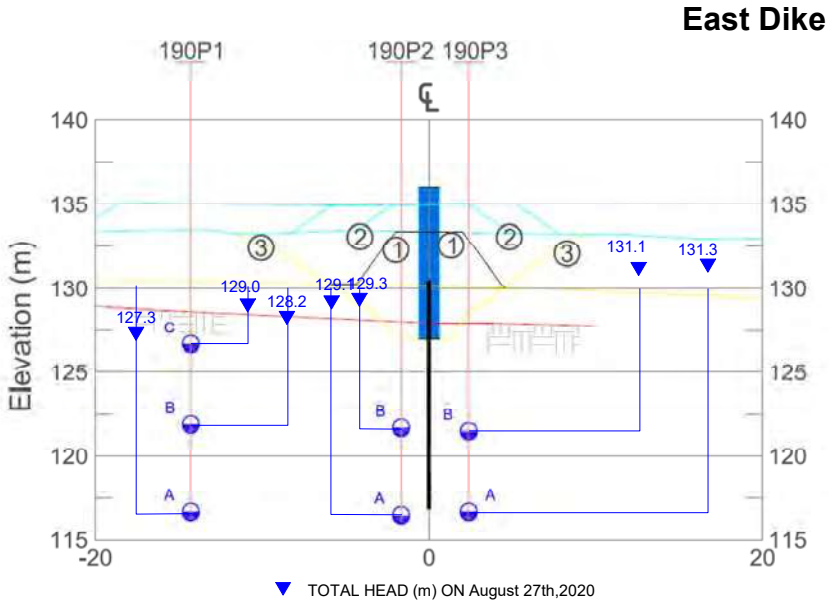


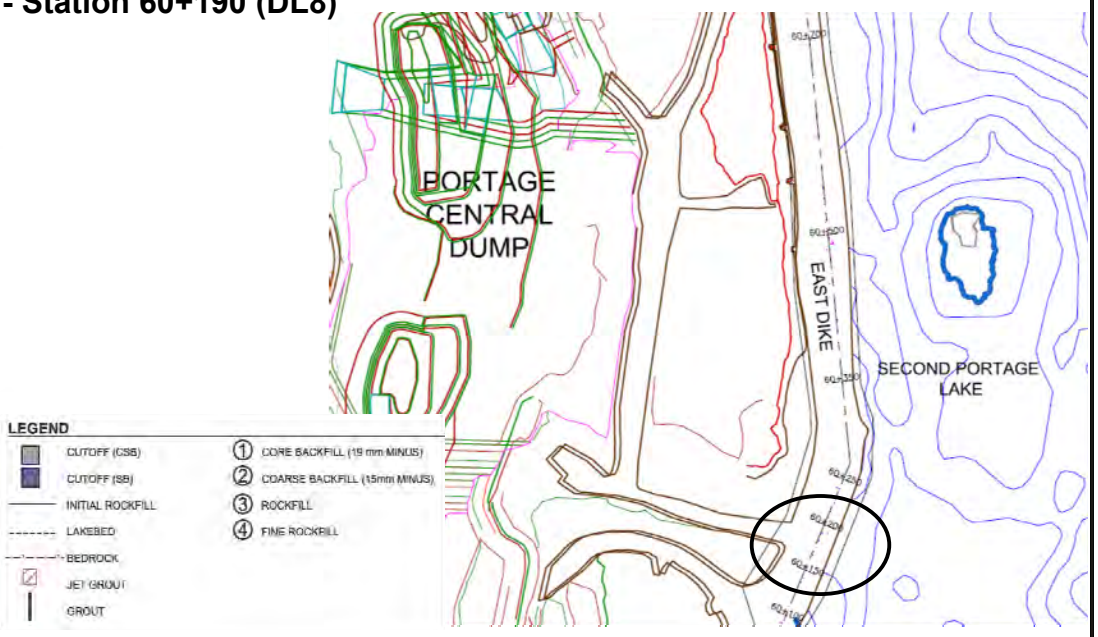


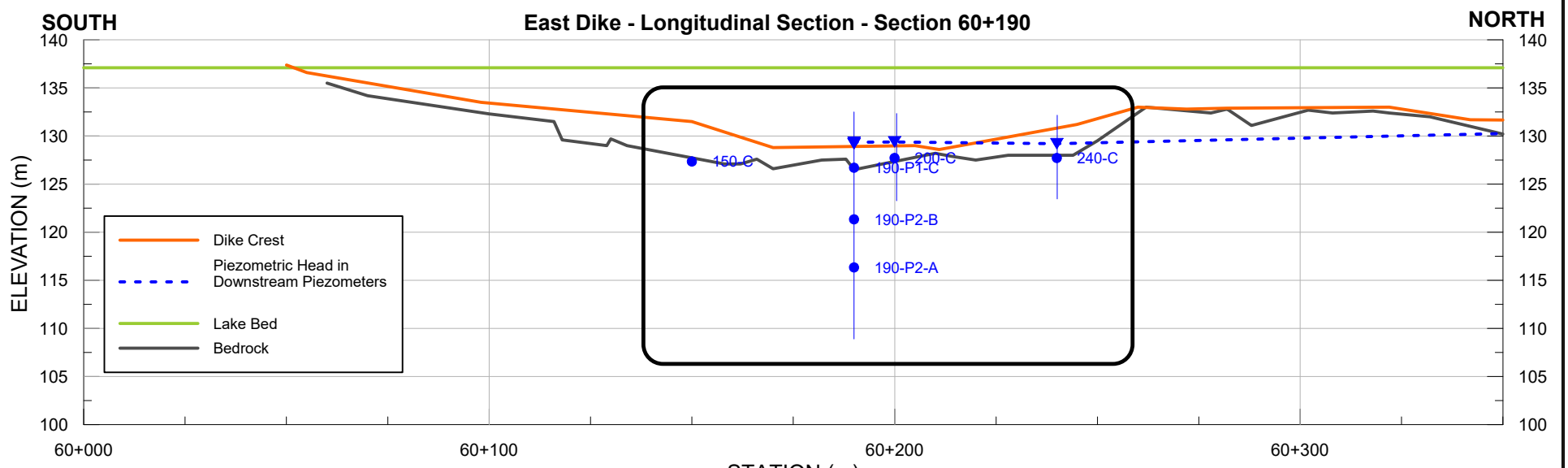


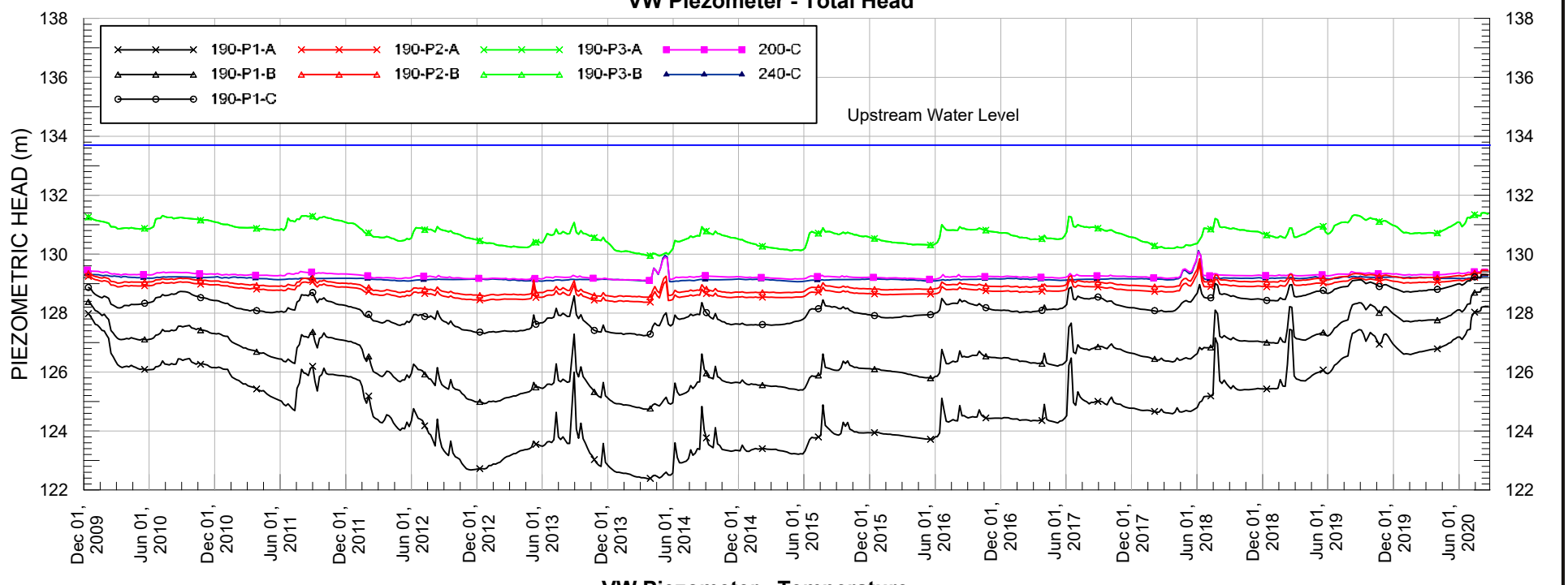


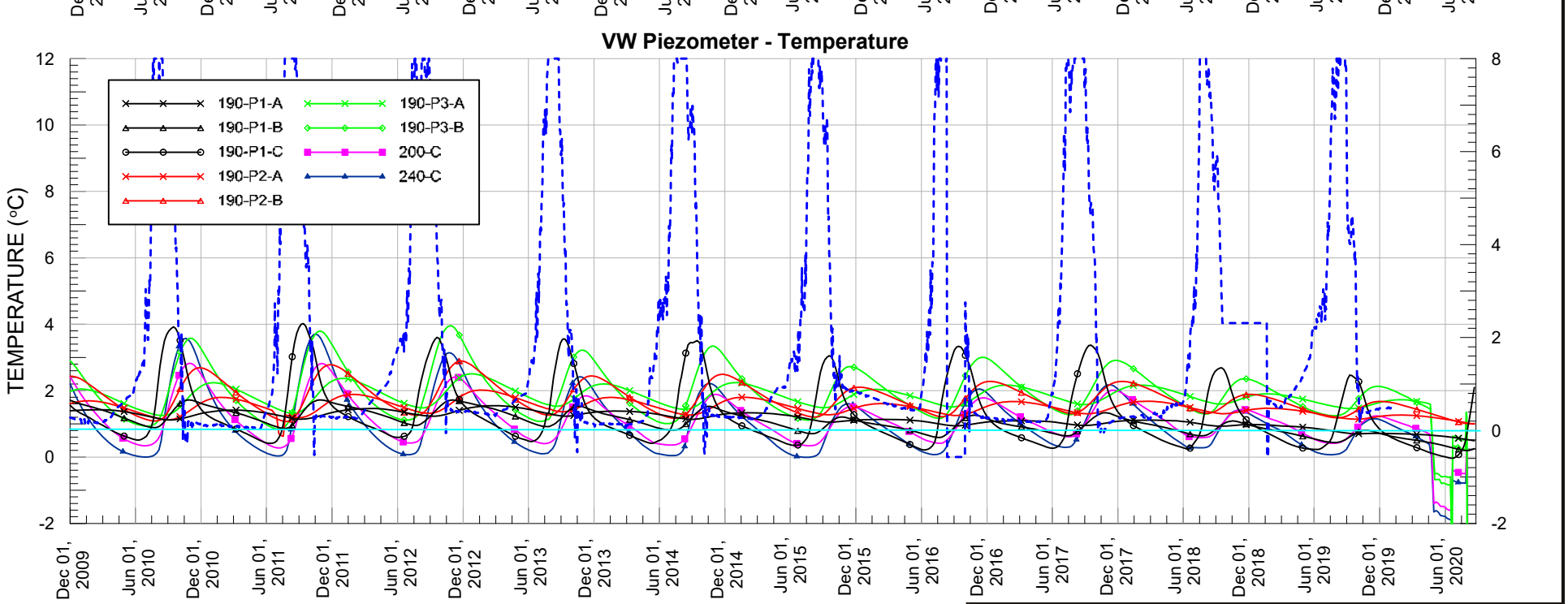
East Dike - Station 60+190 (DL8)











NOTES:
1. 150-C stopped working in Nov 2012
2. Change in PWP and temperature are related to the discharge pipe changed from pit to lake.
3. Bumps in data are from discharge pipes freezing and water bing discharged close to the area.

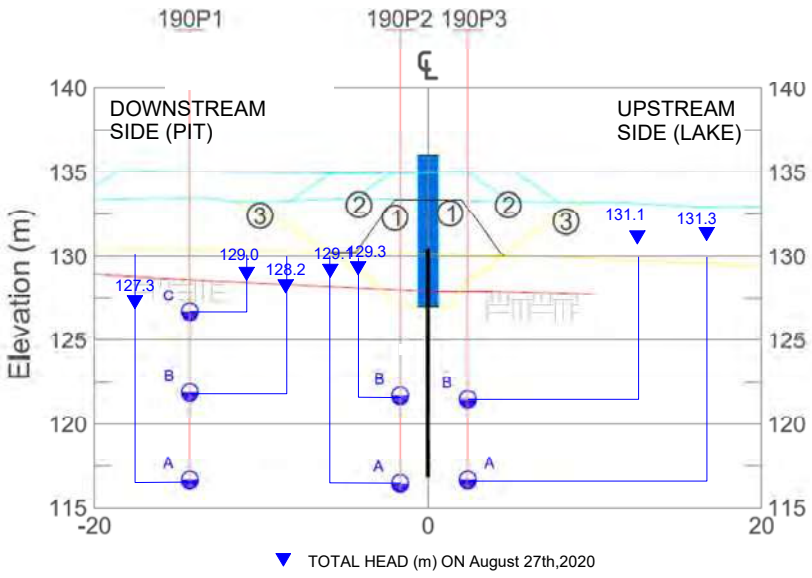
PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

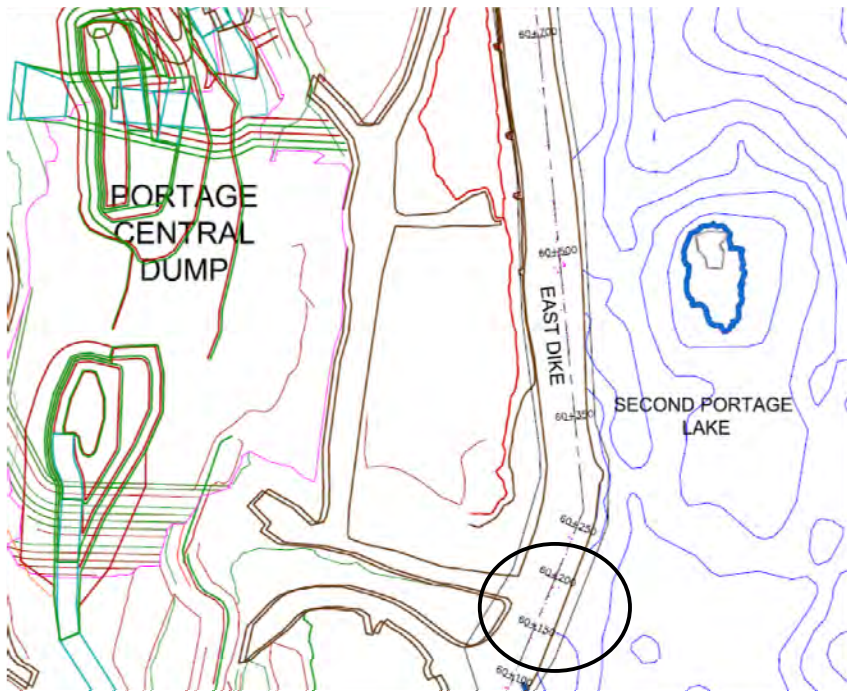
TITLE: EAST DIKE
Section 60+190 - PIEZOMETRIC DATA
(Dec 1/09 to Aug 27/20)

AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	FIGURE 45	
REVIEW				

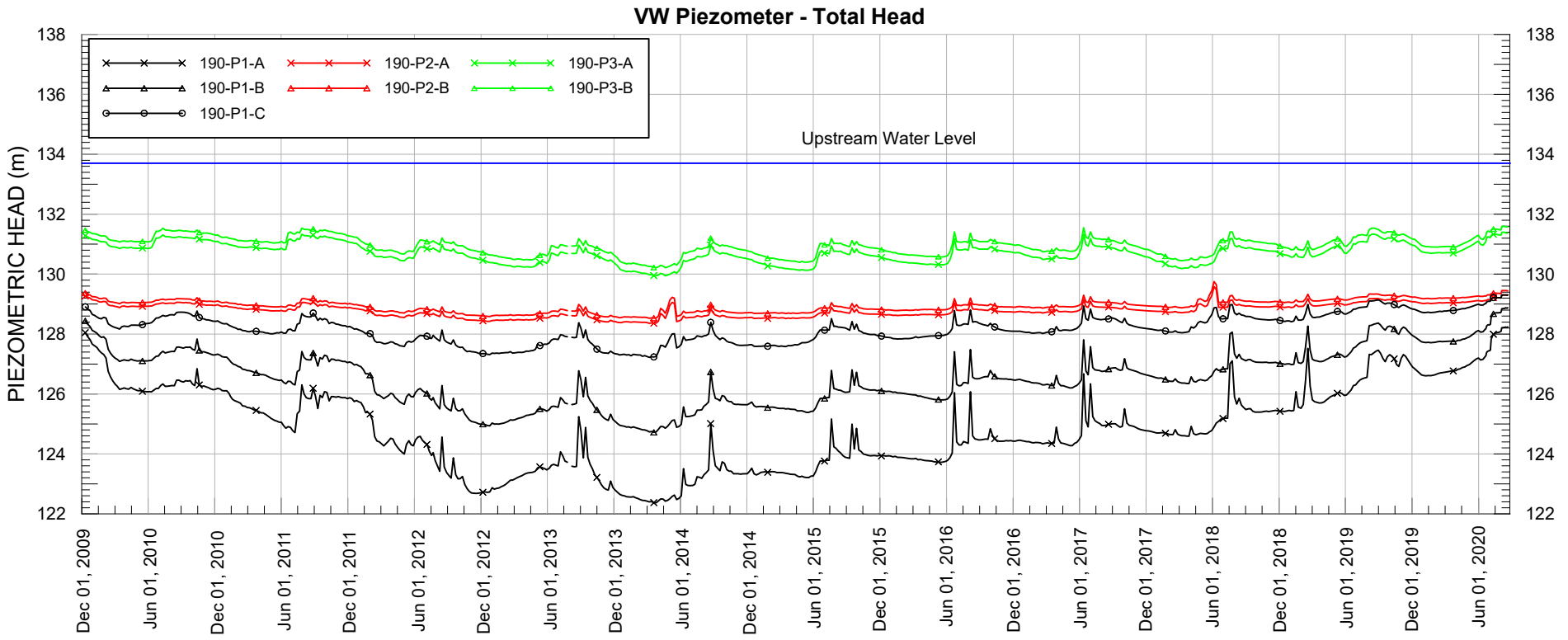
STATION 60+190

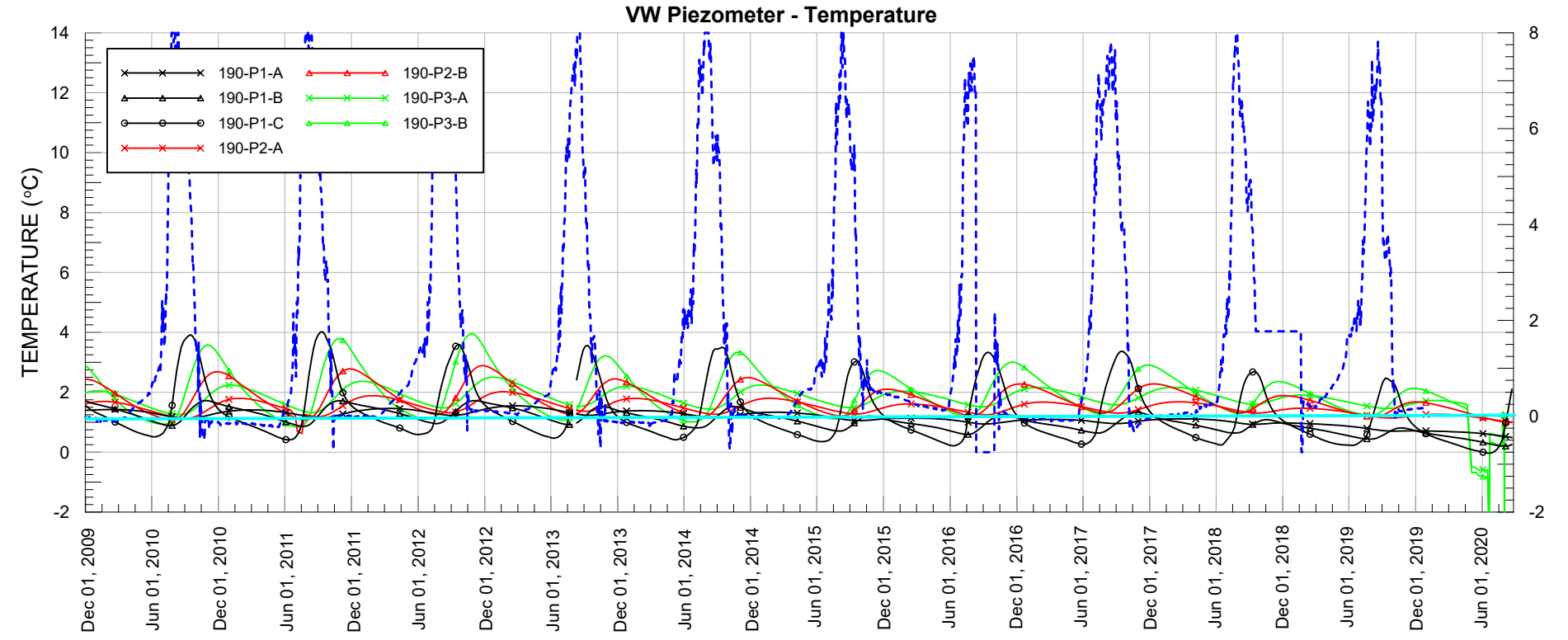




LEGEND

- CUTOFF (CSB)
- CUTOFF (SB)
- INITIAL ROCKFILL
- LAKEBED
- BEDROCK
- JET GROUT
- GROUT
- ① CORE BACKFILL (19 mm MINUS)
- ② COARSE BACKFILL (15mm MINUS)
- ③ ROCKFILL
- ④ FINE ROCKFILL





NOTES:

1. Change in PWP and temperature are related to the discharge pipe changed from pit to lake and lake to pit.
2. Bumps in data were caused when the pipes froze and water was dishcarge close by until the pipes were fixed.

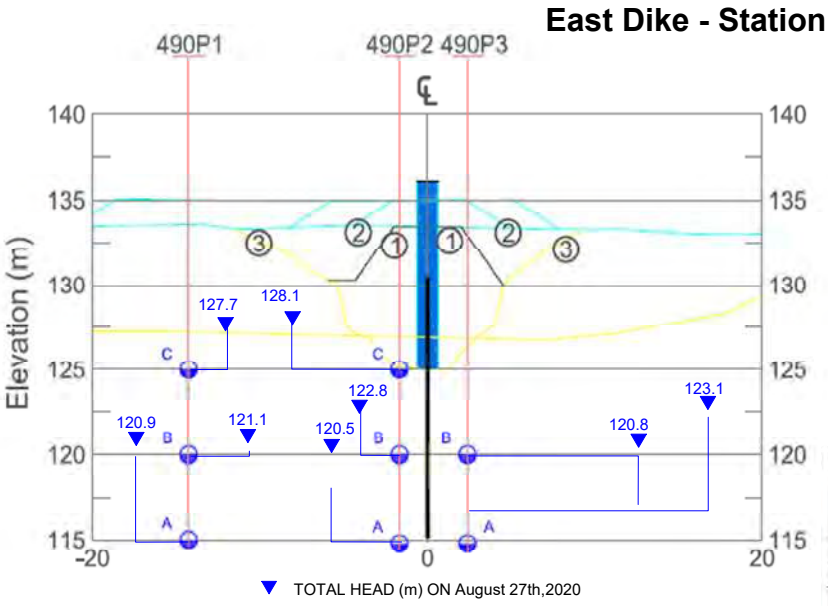
PROJECT: **AGNICO EAGLE MINES LIMITED**
MEADOWBANK GOLD PROJECT
NUNAVUT

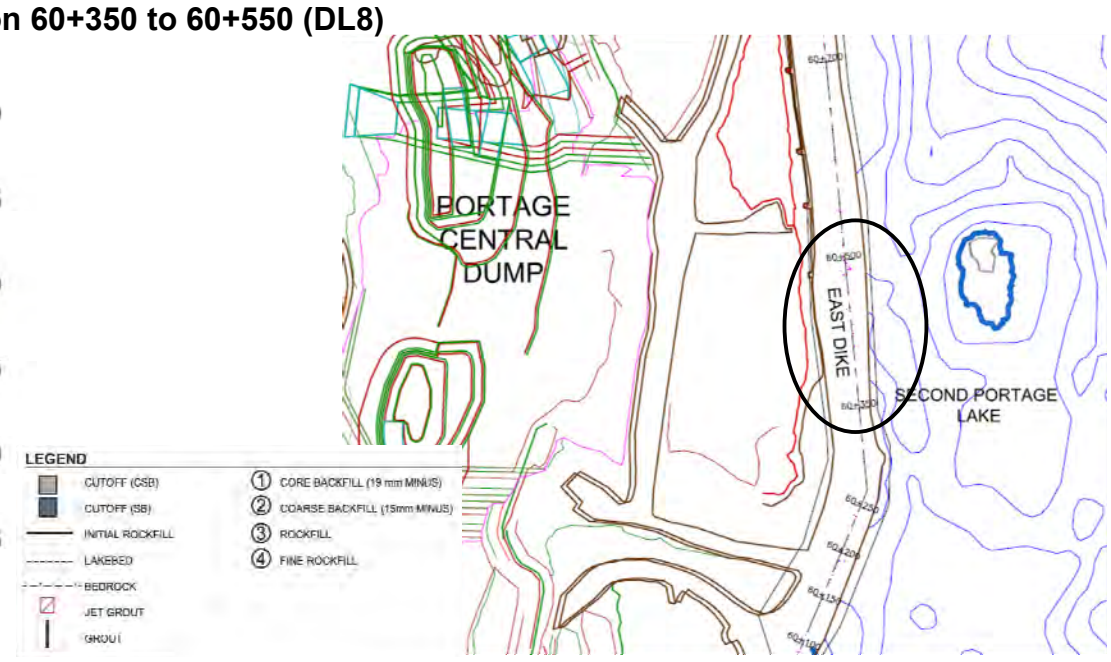
TITLE: **EAST DIKE - SECTION 60+190**
PIEZOMETRIC DATA
(Dec 1/09 to Aug 27/20)

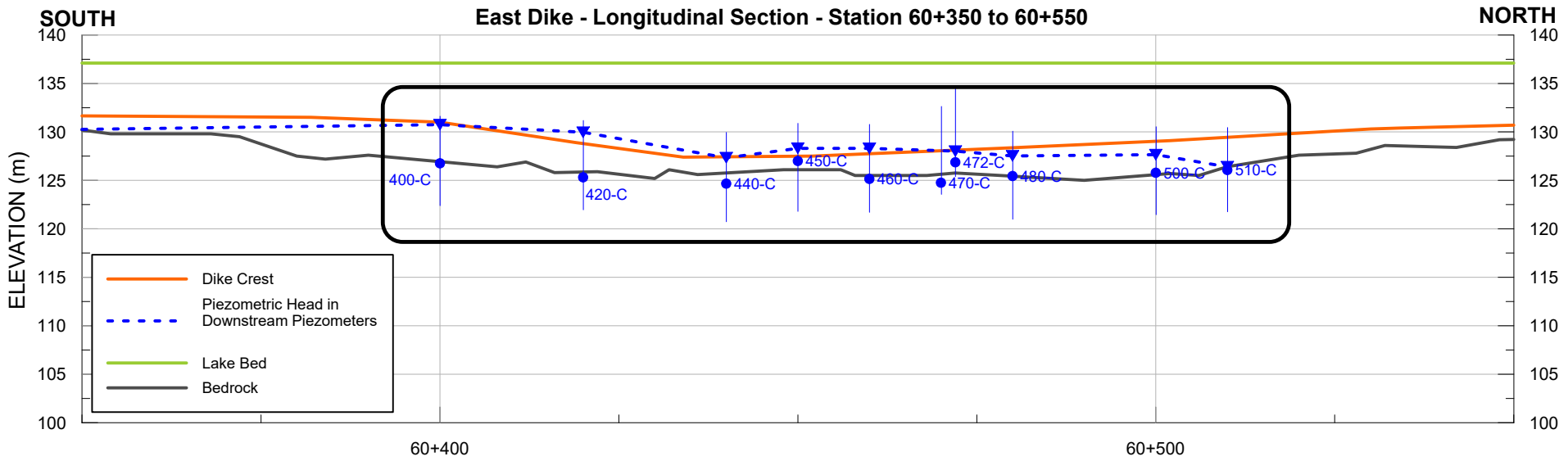
AGNICO EAGLE
MEADOWBANK

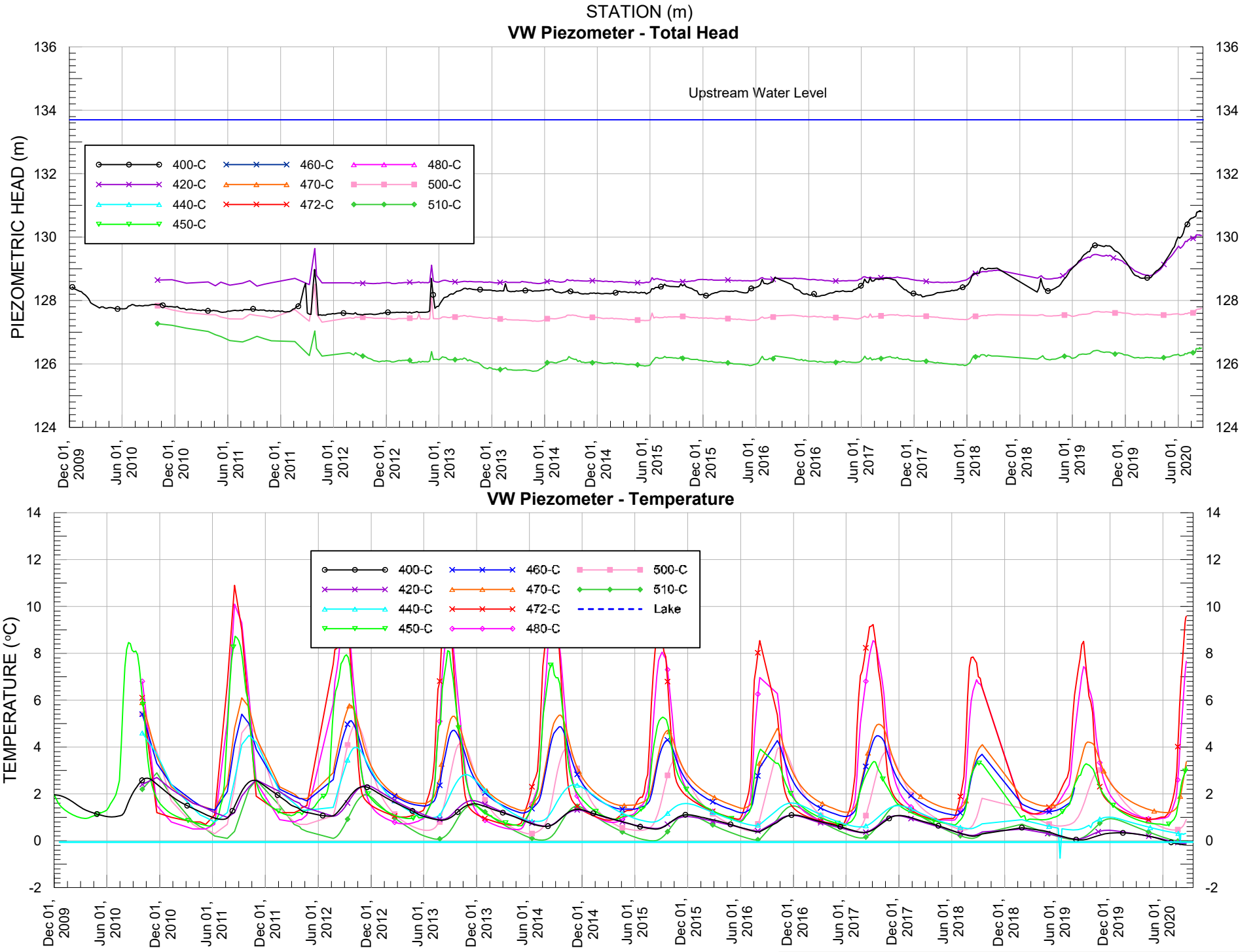
PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	**FIGURE 46**	
REVIEW				

East Dike - Station 60+350 to 60+550 (DL8)









NOTES:

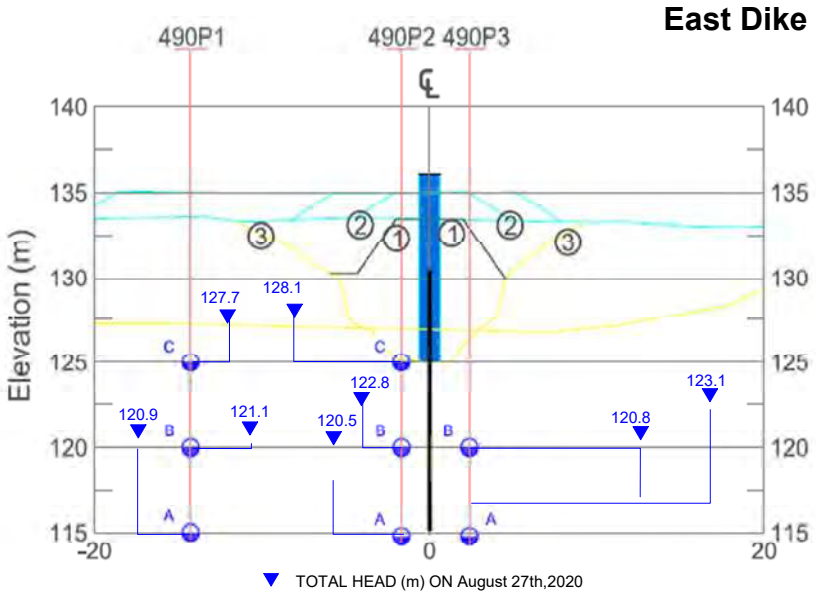
1. As seen in the graph on the side, the progression of the temperature in the Pz follows the lake temperature closely. Usually it takes approximately one to two weeks to see the trend following the lake temperature.
2. Increase in pressure each year is noted to be possibly ice buildup at the toe as also report the annual inspection. Nothing was noted in the field

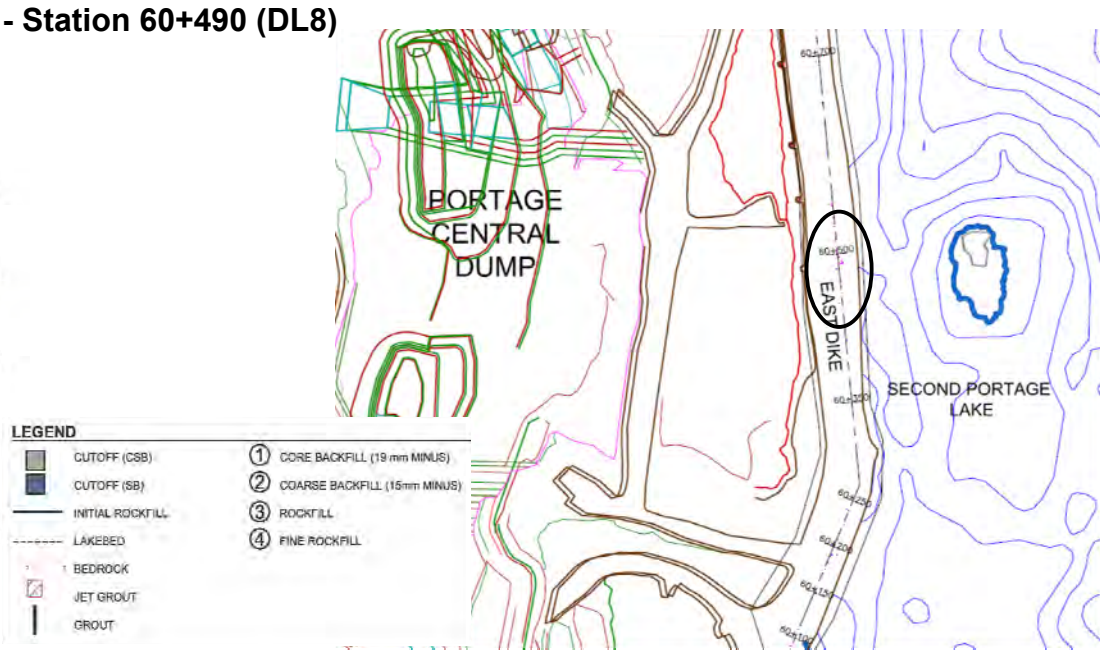
PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	EAST DIKE Section 60+350 to 60+550 - PIEZOMETRIC DATA (Dec 1/09 to Aug 27/20)

AGNICO EAGLE MEADOWBANK

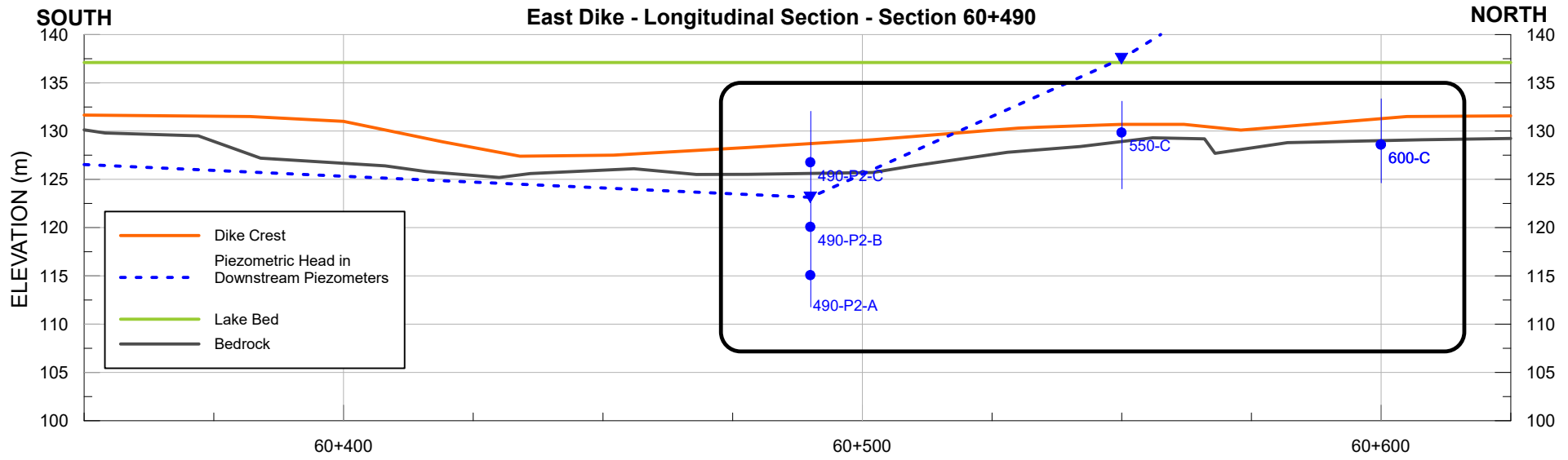
PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	FIGURE 47	
REVIEW				

East Dike - Station 60+490 (DL8)

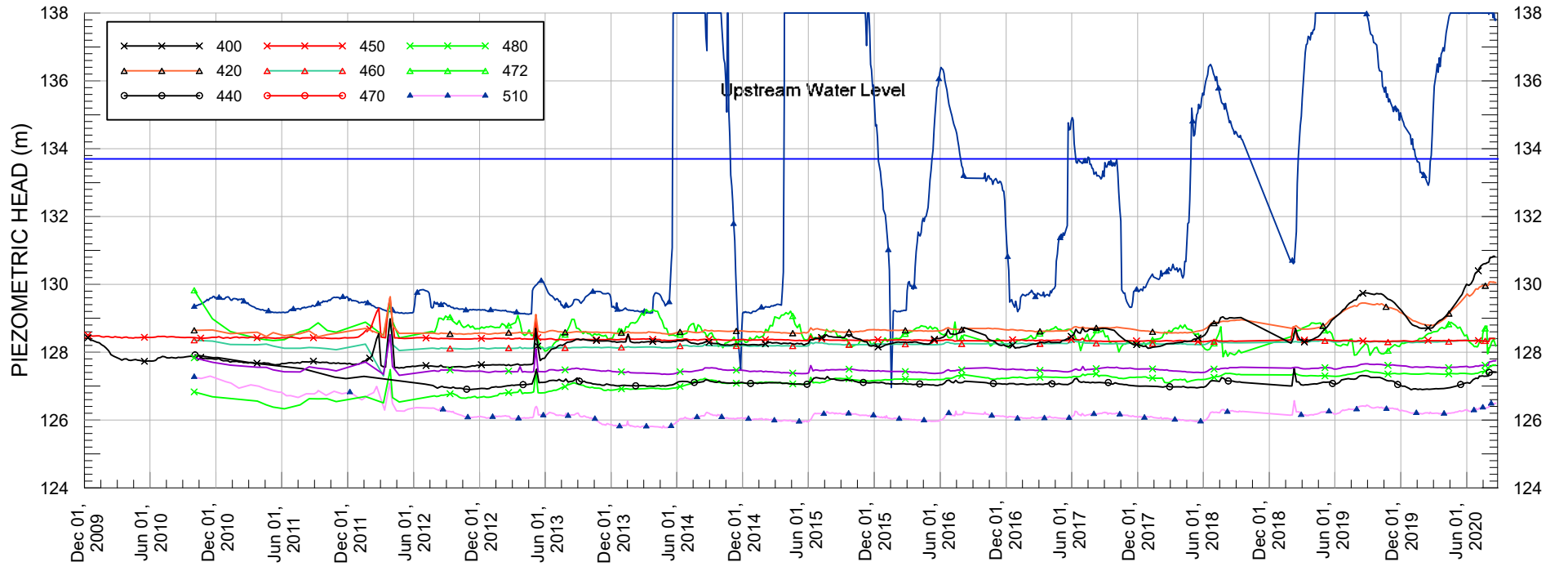




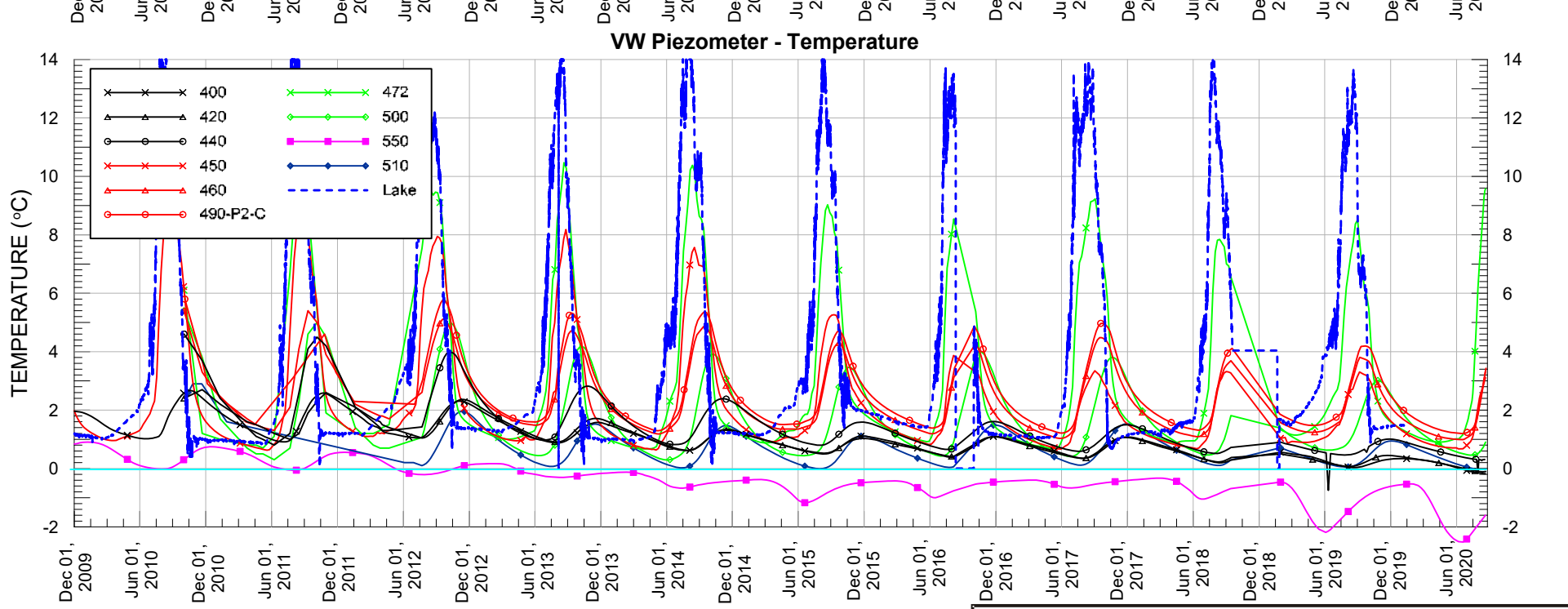
East Dike - Longitudinal Section - Section 60+490



VW Piezometer - Total Head



VW Piezometer - Temperature



NOTES:

1: 550-C and 600-C are giving unreliable readings and with a negative temperature are assumed to be frozen.

2. As seen in the graph on the side, the progression of the temperature in the Pz follows the lake temperature closely. Usually it takes approximately one to two weeks to see the trend following the lake temperature.

3. Increase in pressure each year is noted to be possibly ice buildup at the toe as also report the annual inspection. Nothing was noted in the field

PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

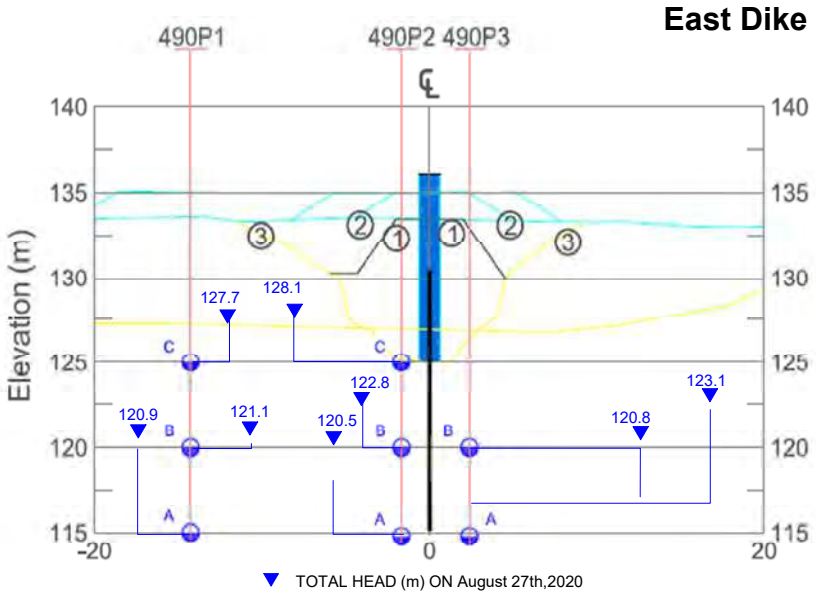
TITLE: EAST DIKE
Section 60+490 - PIEZOMETRIC DATA
(Dec 1/09 to Aug 27/20)

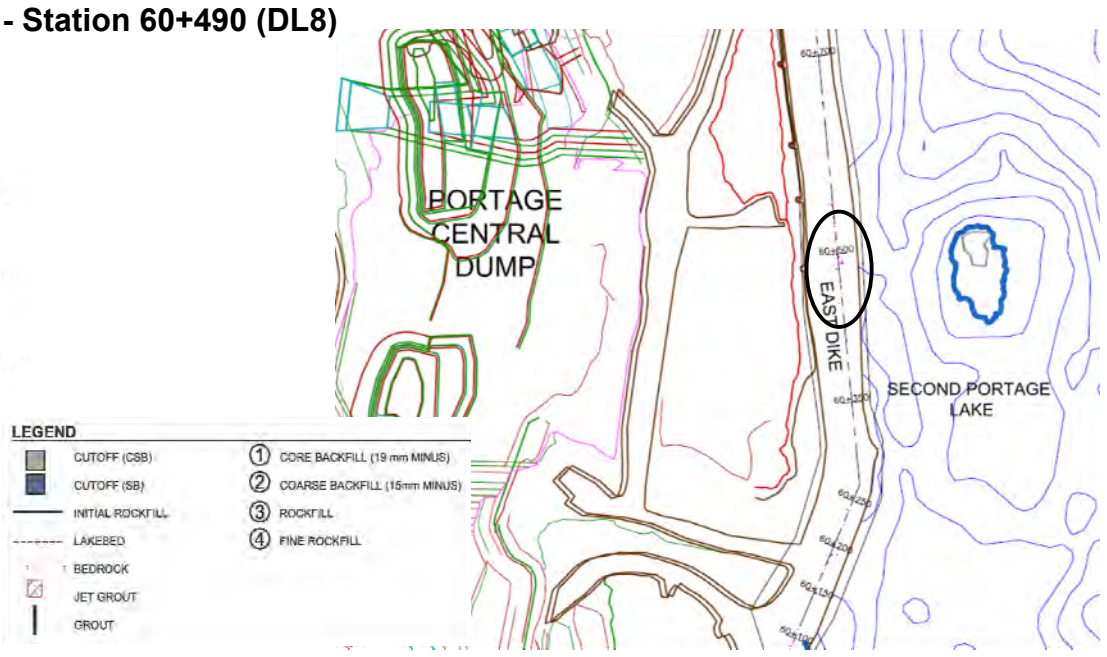
AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14		
REVIEW				

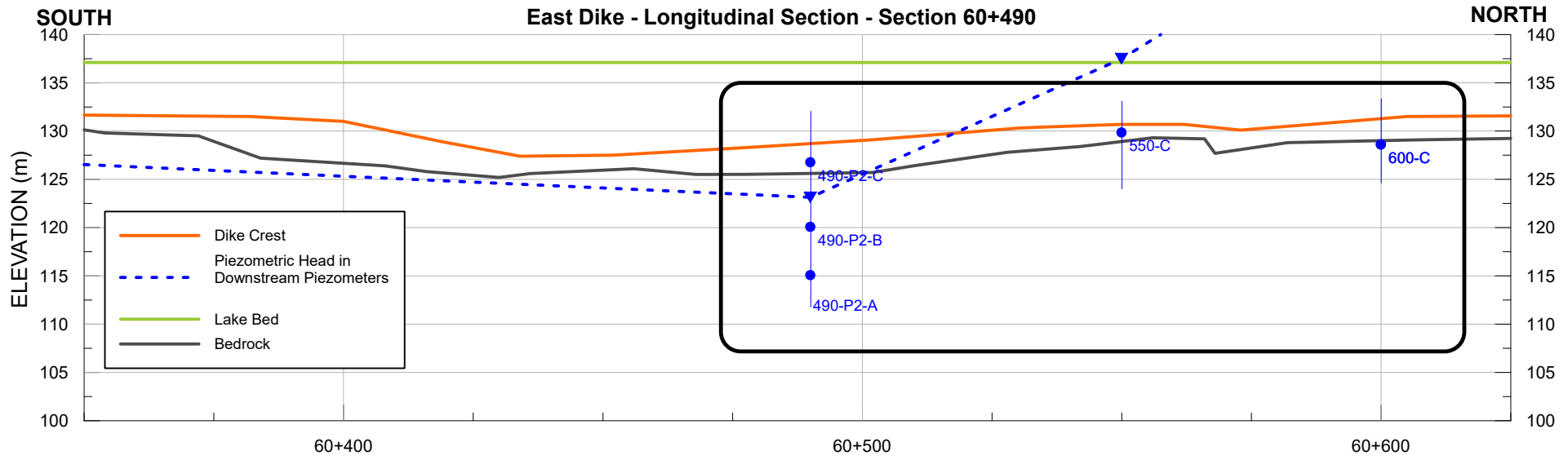
FIGURE 48

East Dike - Station 60+490 (DL8)

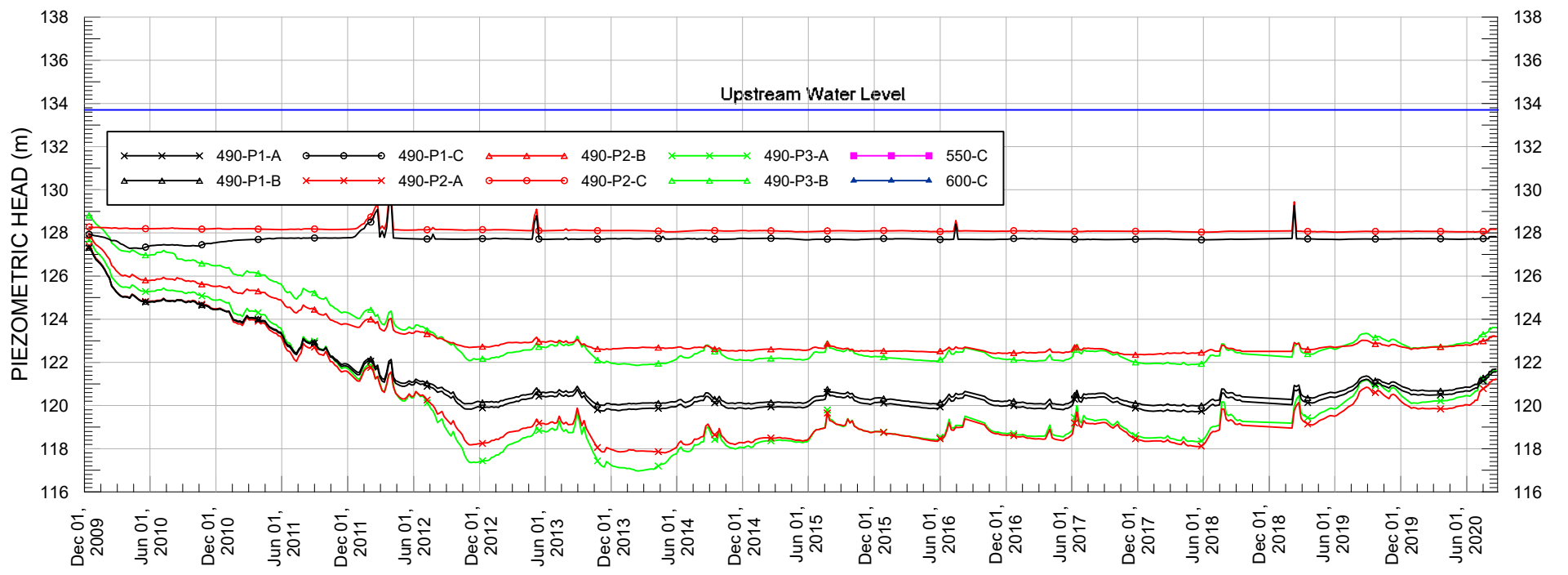




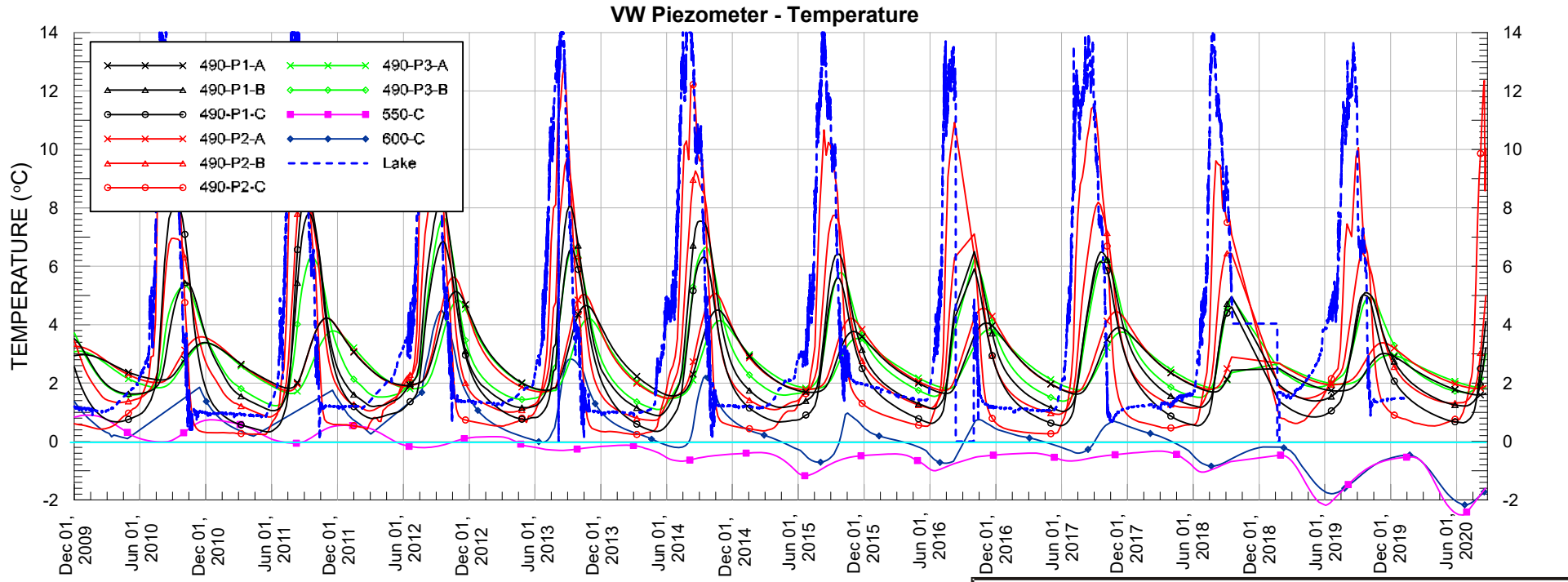
East Dike - Longitudinal Section - Section 60+490



VW Piezometer - Total Head



VW Piezometer - Temperature



NOTES:

1: 550-C and 600-C are giving unreliable readings and with a negative temperature are assumed to be frozen.

2. As seen in the graph on the side, the progression of the temperature in the Pz follows the lake temperature closely. Usually it takes approximately one to two weeks to see the trend following the lake temperature.

3. Increase in pressure each year is noted to be possibly ice buildup at the toe as also report the annual inspection. Nothing was noted in the field

PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

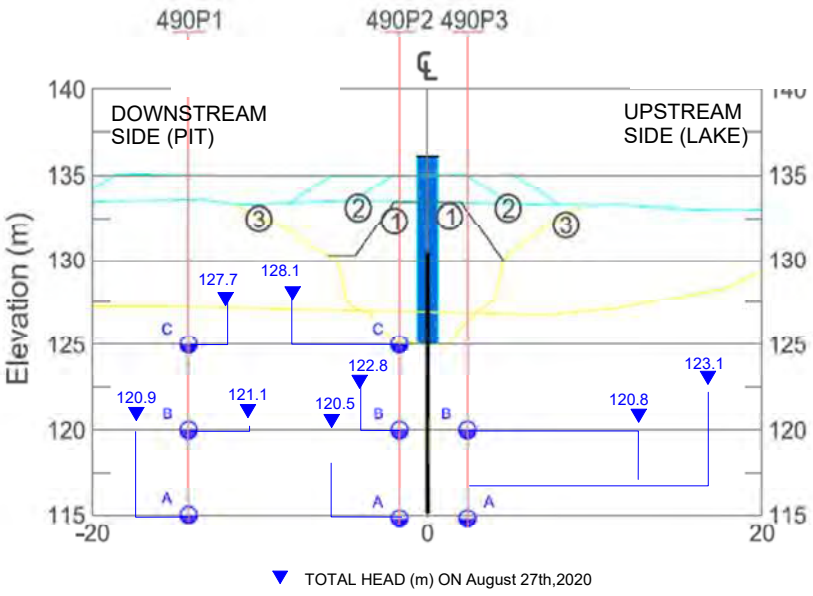
TITLE: EAST DIKE
Section 60+490 - PIEZOMETRIC DATA
(Dec 1/09 to Aug 27/20)

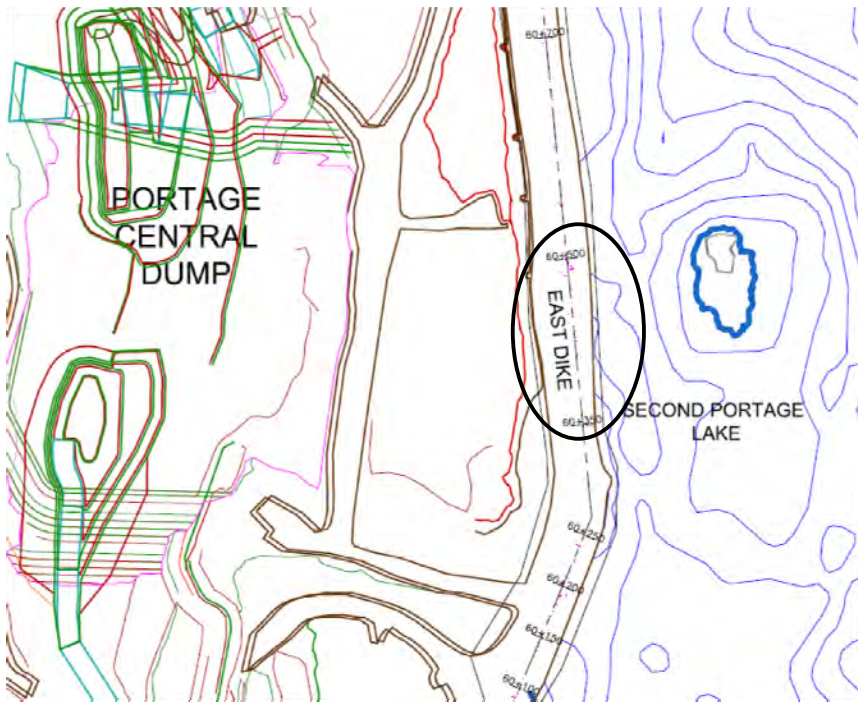
AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14		
REVIEW				

FIGURE 48

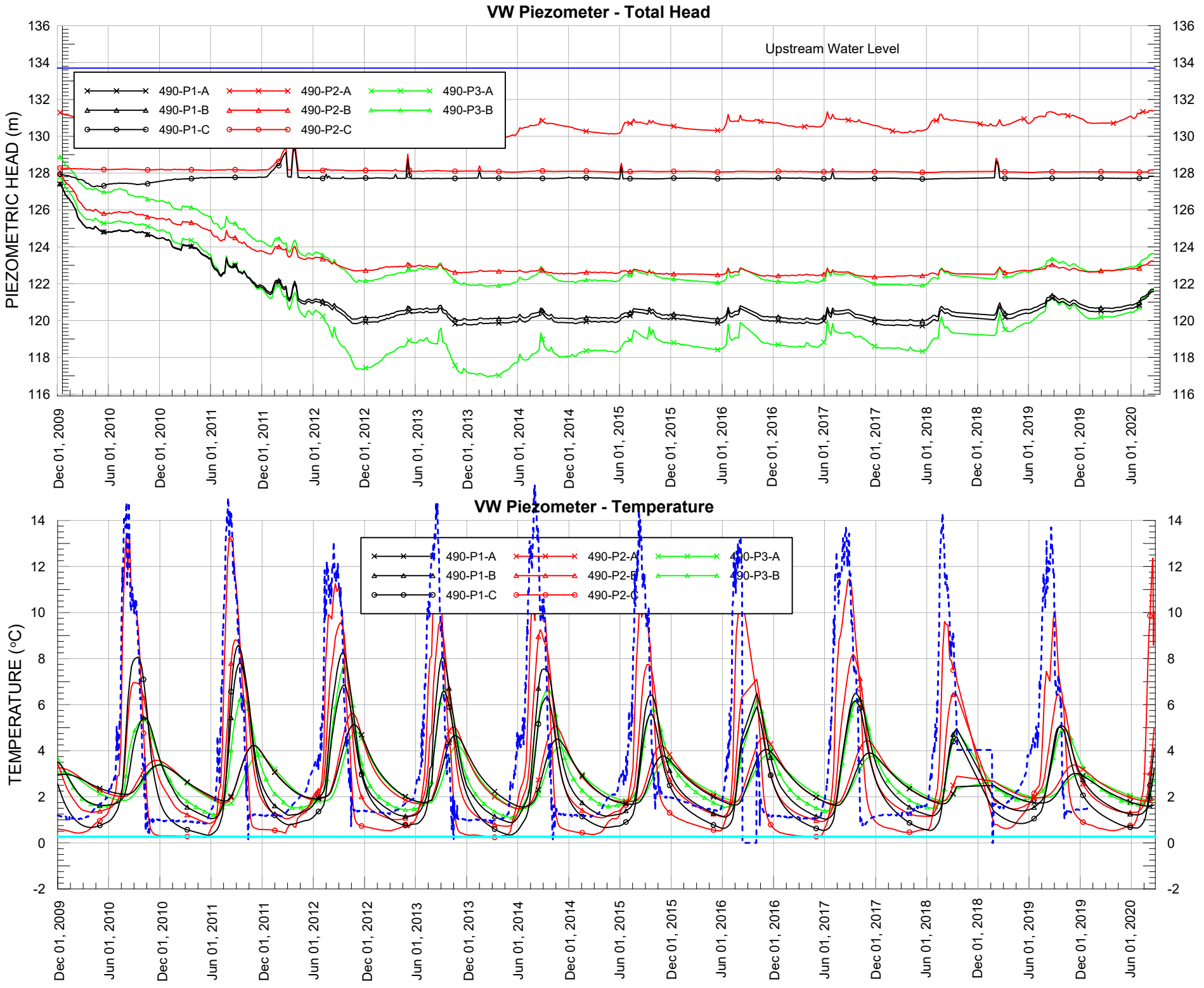
STATION 60+490





LEGEND

- CUTOFF (CSB)
- CUTOFF (SB)
- INITIAL ROCKFILL
- LAKEBED
- BEDROCK
- JET GROUT
- GROUT
- ① CORE BACKFILL (19 mm MINUS)
- ② COARSE BACKFILL (15mm MINUS)
- ③ ROCKFILL
- ④ FINE ROCKFILL

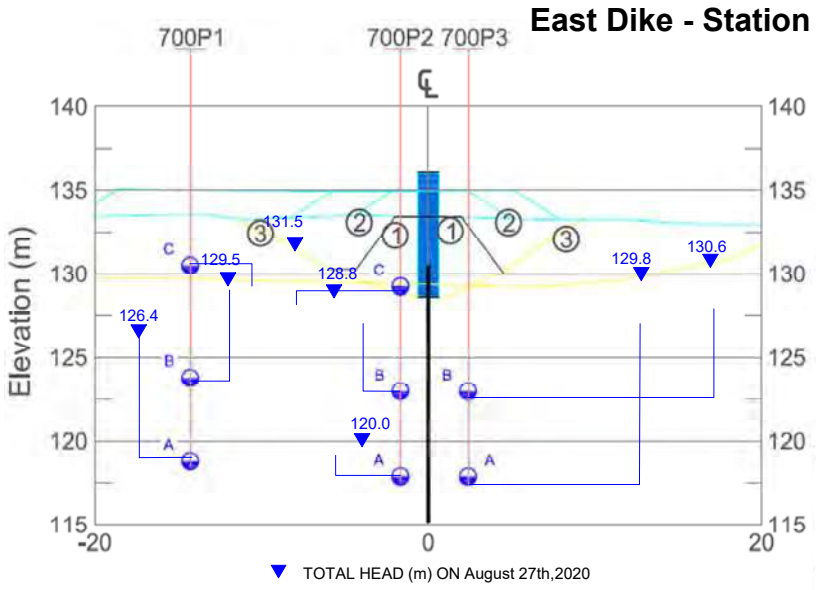


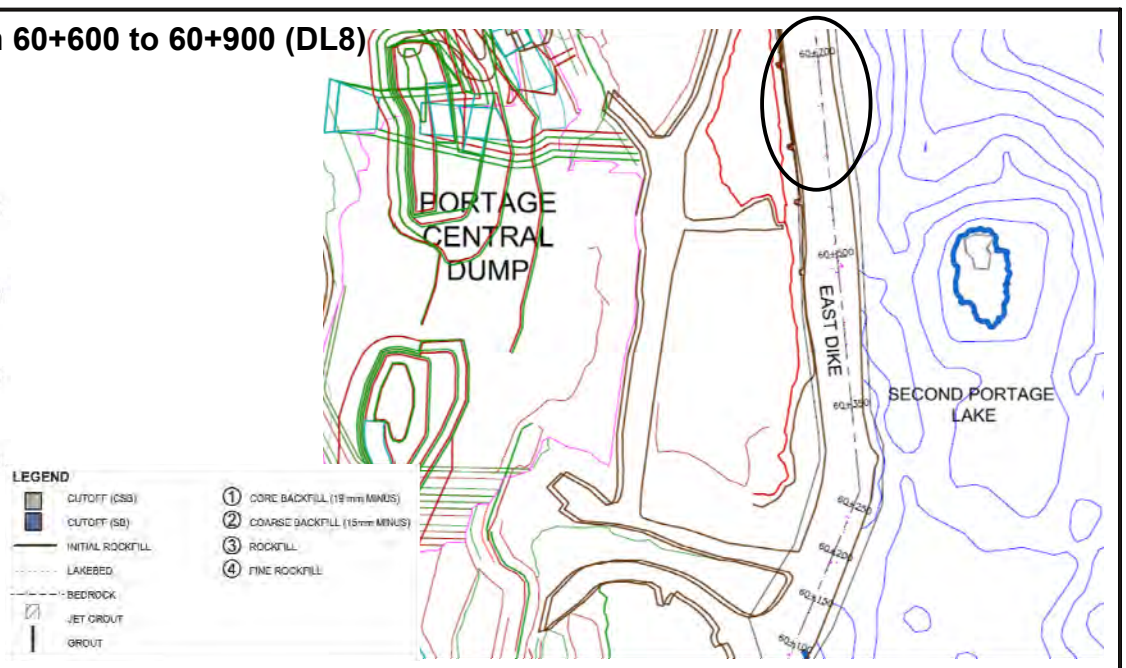
NOTES:

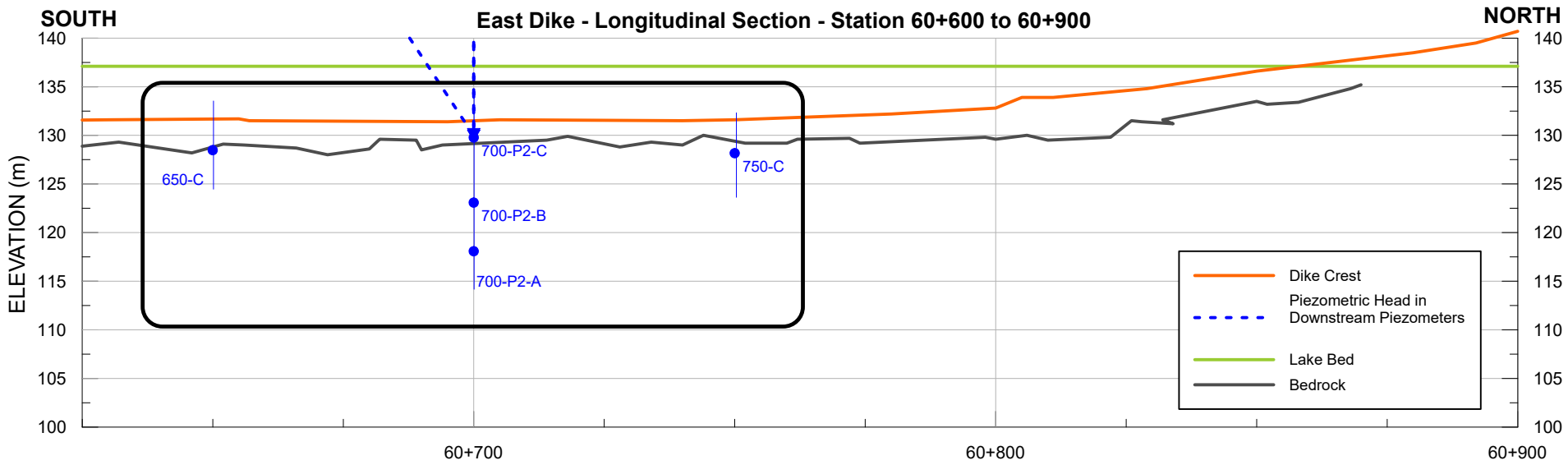
1. As seen in the graph on the side, the progression of the temperature in the Pz follows the lake temperature closely. Usually it takes approximately one to two weeks to see the trend following the lake temperature.
2. Bumps in data were caused when the pipes froze and water was dishcarge close by until the pipes were fixed.

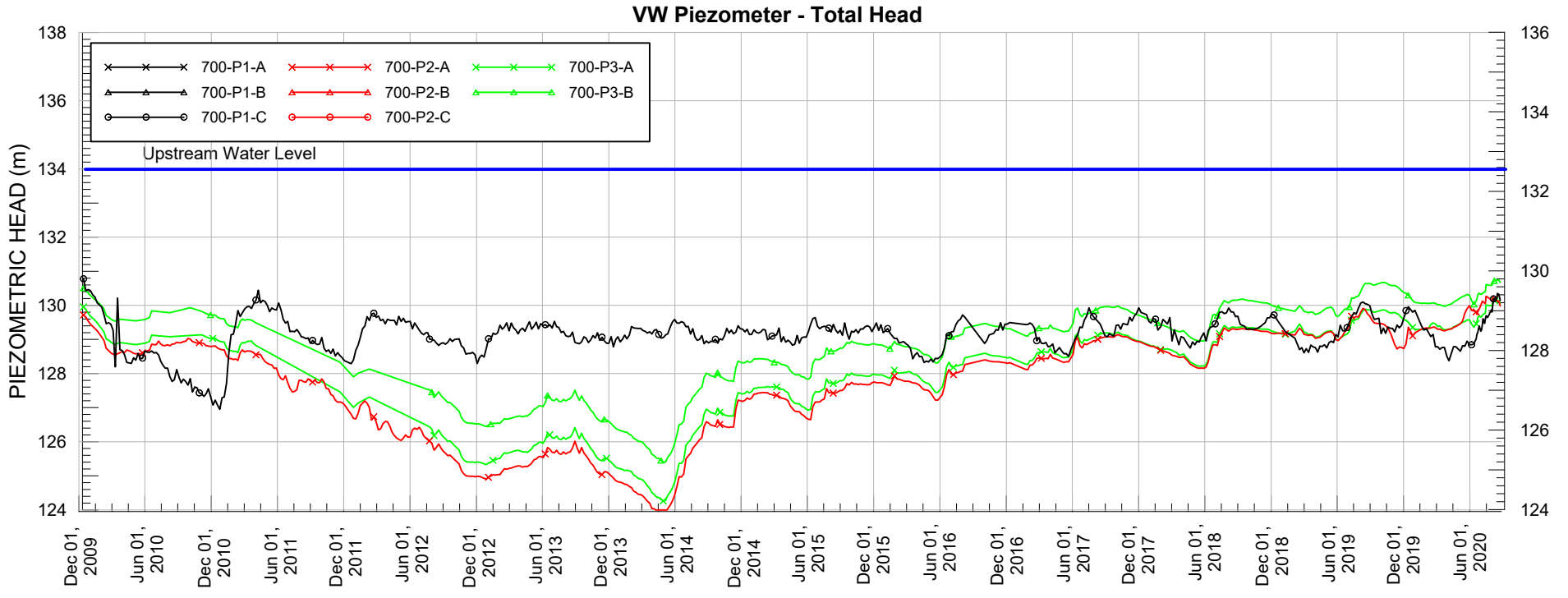
PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT		
TITLE	EAST DIKE - SECTION 60+490 PIEZOMETRIC DATA (Dec 1/09 to Aug 27/20)	PG	28AUG14
AGNICO EAGLE MEADOWBANK	PROJECT No.		PHASE No.
	DESIGN TD	28AUG14	SCALE AS SHOWN REV.
	CADD TD	28AUG14	FIGURE 49
	CHECK		
	REVIEW		

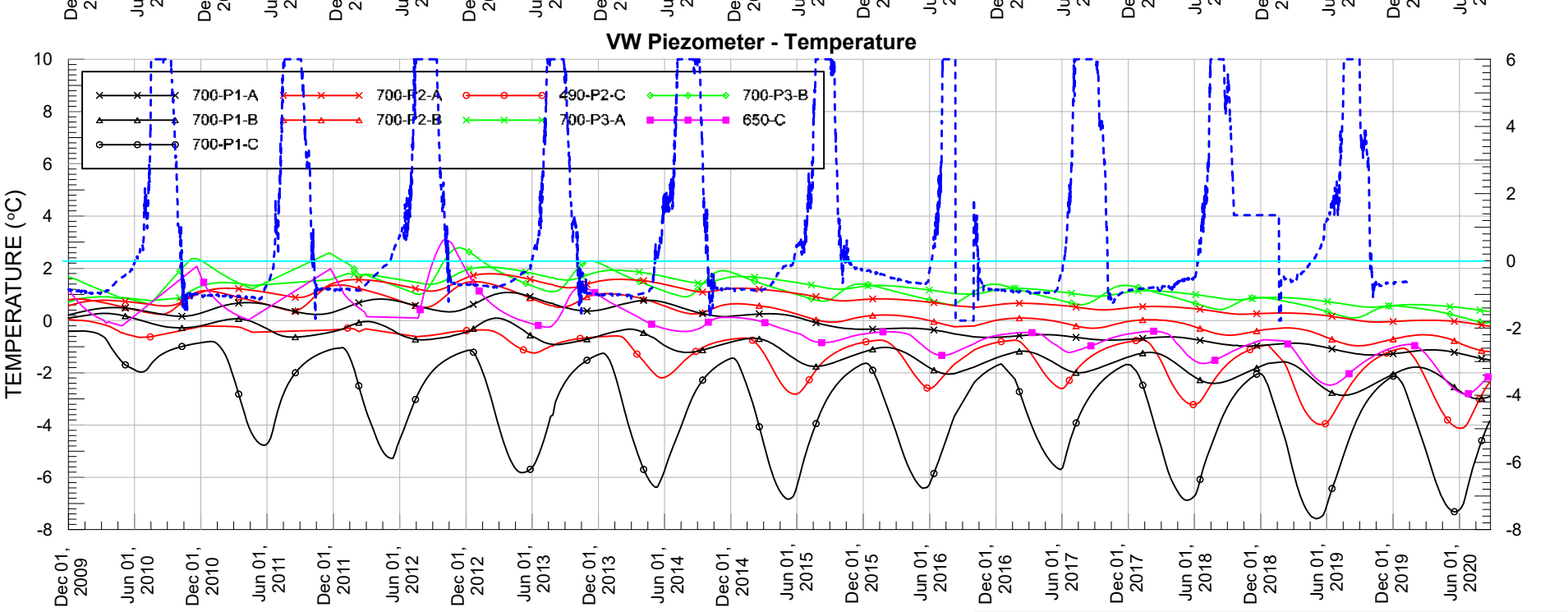
East Dike - Station 60+600 to 60+900 (DL8)











NOTES:
1: 700-P1-B and 750-C are giving unreliable readings and with a negative temperature are assumed to be frozen.
2. PWP follows same trends as previous years.

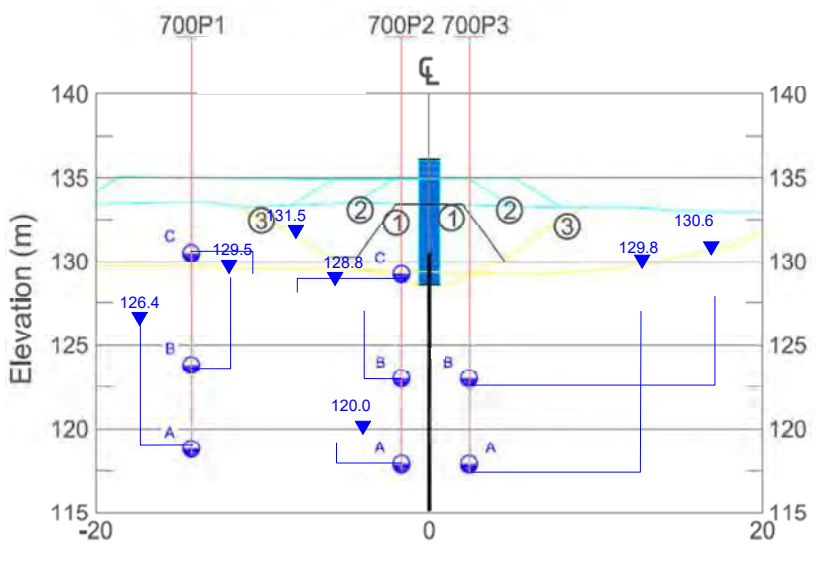
PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

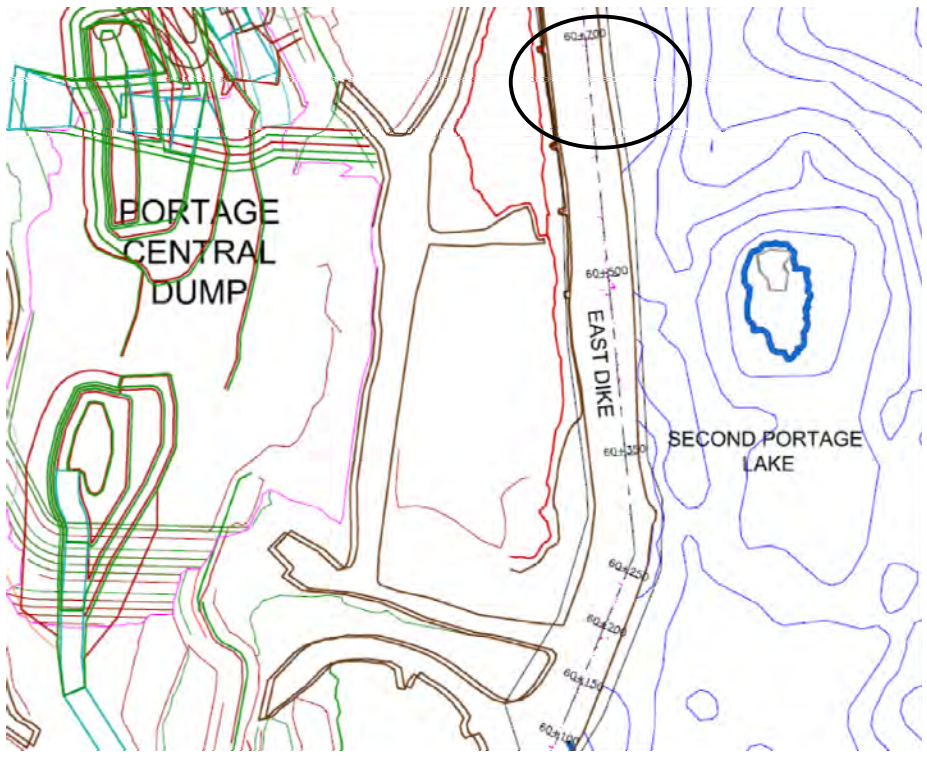
TITLE: EAST DIKE
Section 60+600 to 60+900 - PIEZOMETRIC DATA
(Dec 1/09 to Aug 27/20)

AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	FIGURE 50	
REVIEW				

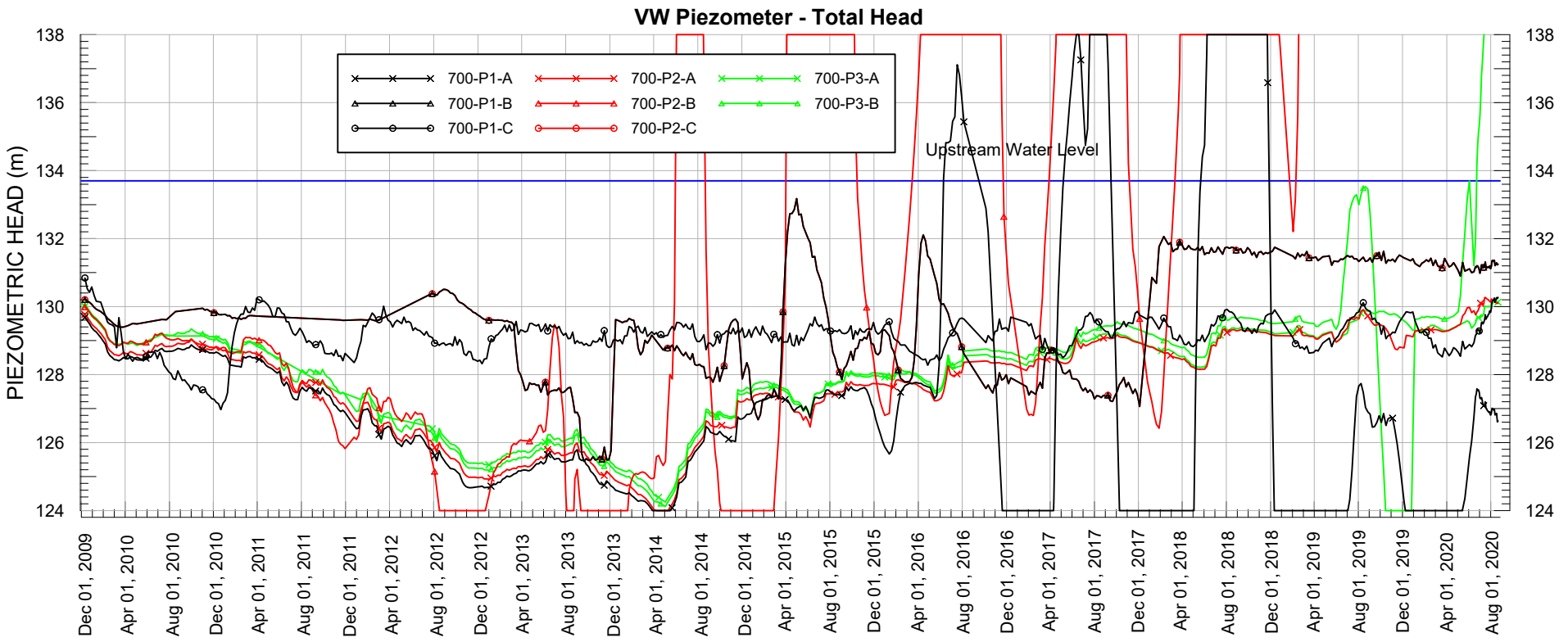
STATION 60+700

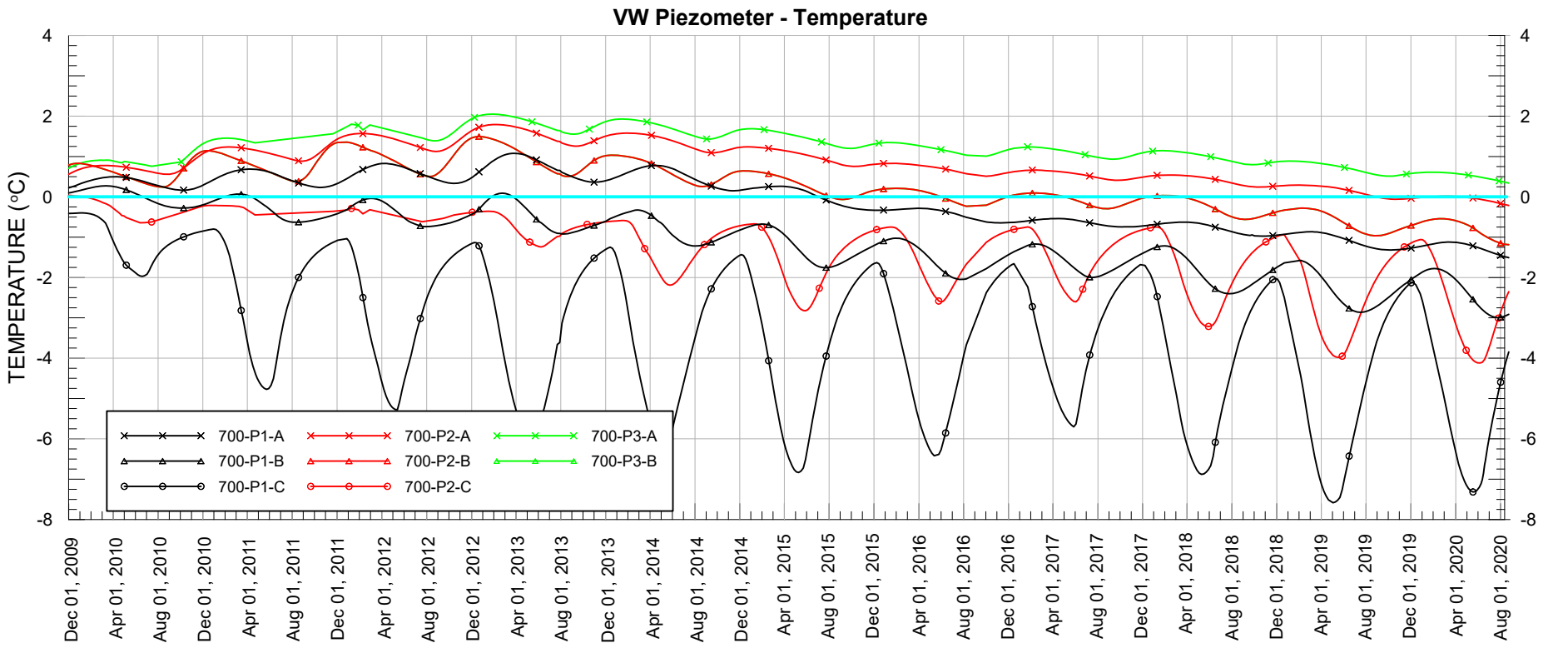




LEGEND

- CUTOFF (CSB)
- CUTOFF (SB)
- INITIAL ROCKFILL
- LAKEBED
- BEDROCK
- JET GROUT
- GROUT
- ① CORE BACKFILL (19 mm MINUS)
- ② COARSE BACKFILL (15mm MINUS)
- ③ ROCKFILL
- ④ FINE ROCKFILL





NOTES:
1: 700-P1-B and 750-C are giving anomoly readings and with a negative temperature are assumed to be frozen and data is not considered reliable.

PROJECT	**AGNICO EAGLE MINES LIMITED** **MEADOWBANK GOLD PROJECT** **NUNAVUT**
TITLE	**EAST DIKE - SECTION 60+700** **PIEZOMETRIC DATA** **(Dec 1/09 to Aug 27/20)**

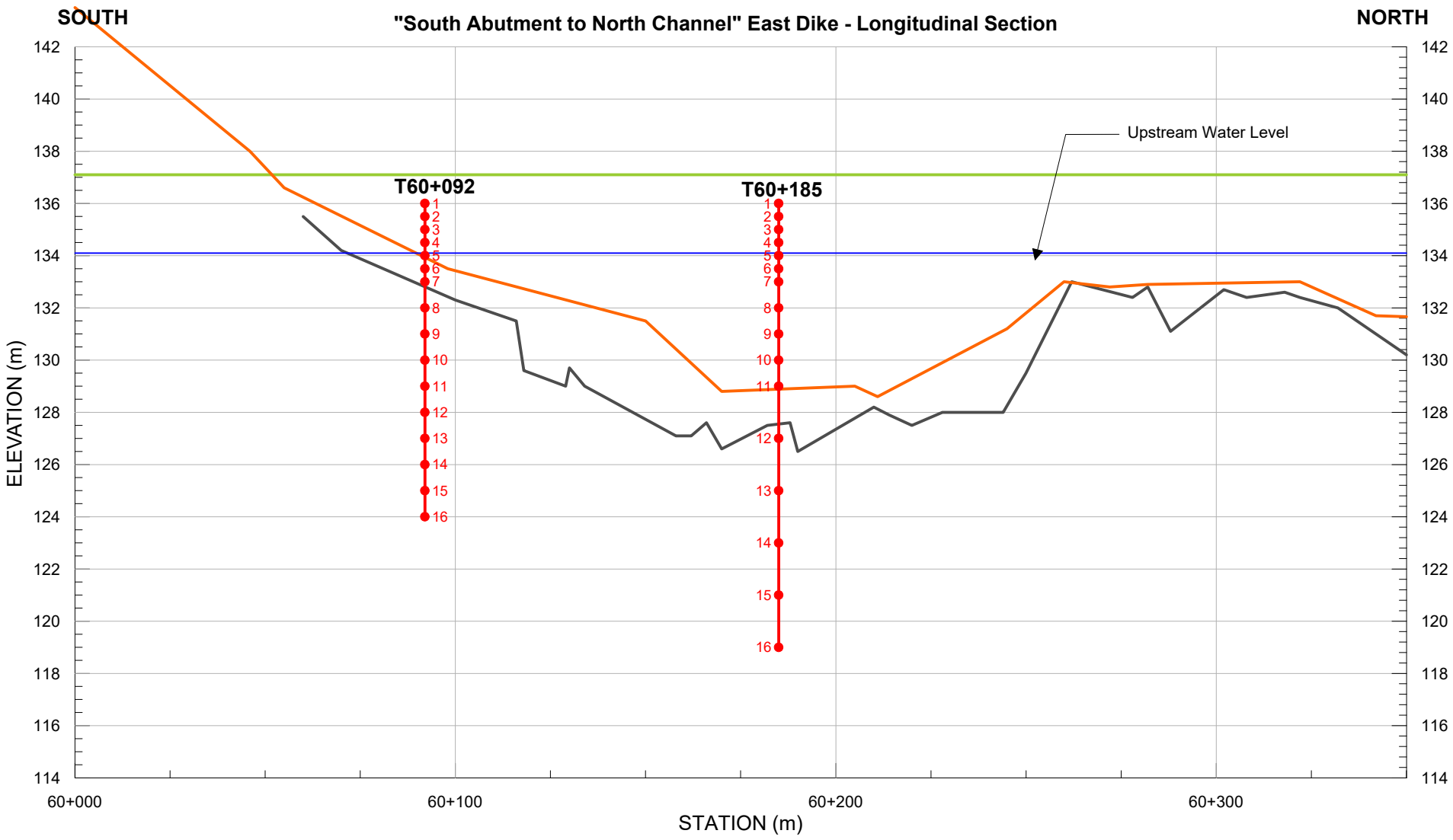
AGNICO EAGLE MEADOWBANK

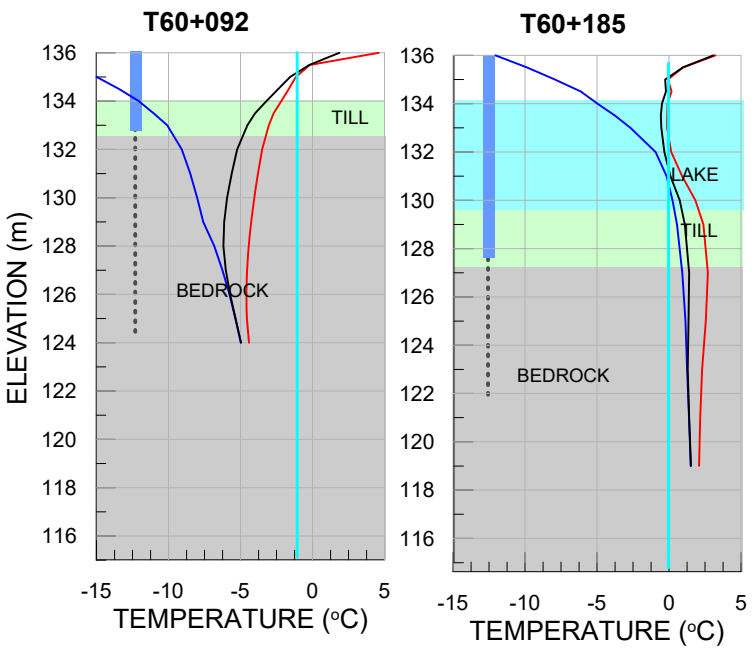
PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	**FIGURE 51**	
REVIEW				

SOUTH

"South Abutment to North Channel" East Dike - Longitudinal Section

NORTH





Current Temperature On August 28, 2020

LEGEND

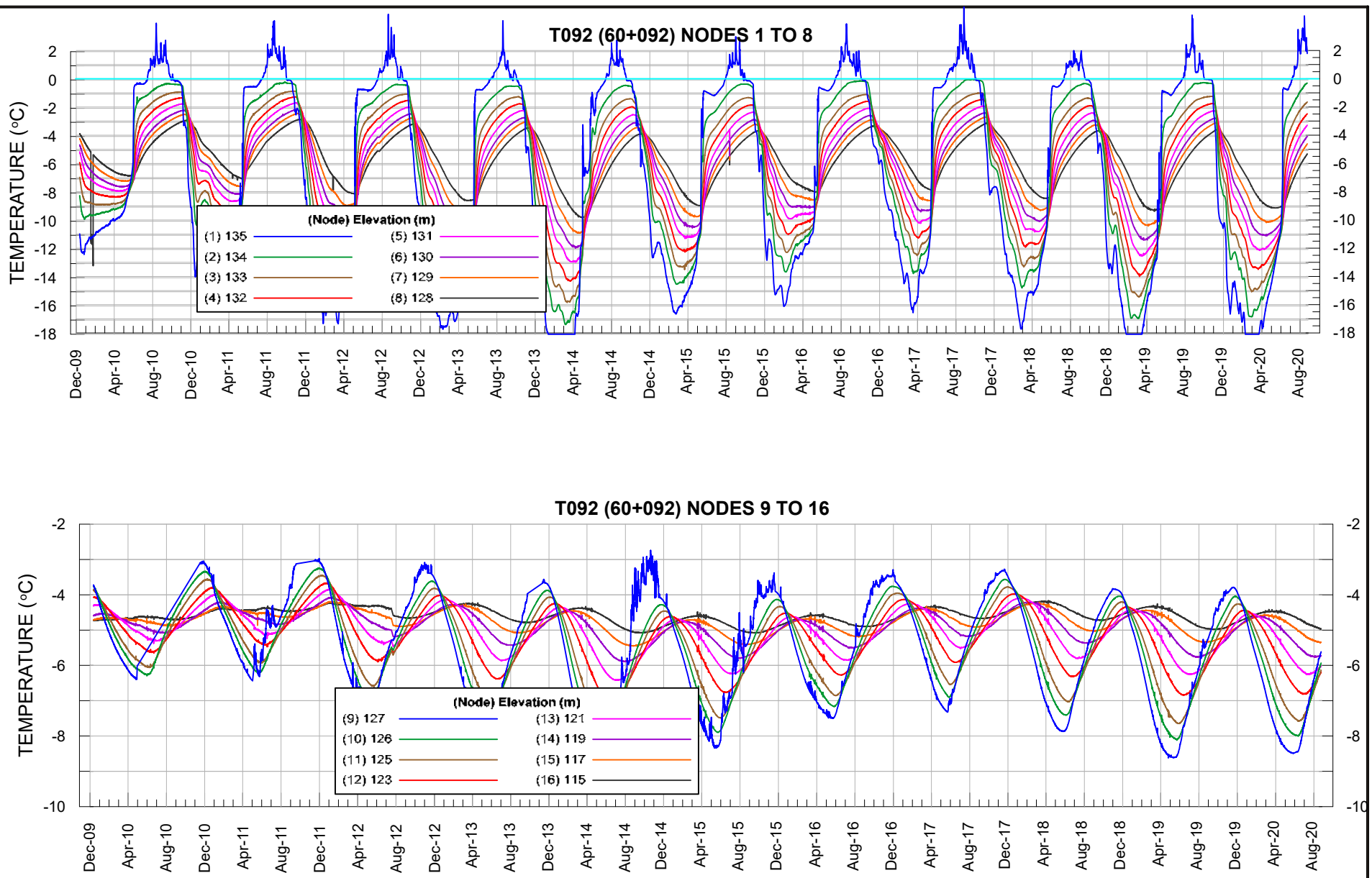
- Dike Crest
- Piezometric Head in Downstream Piezometers
- Lake Bed
- Bedrock
- Lake
- Till
- Bedrock
- 6 / 7 / 8 / 9 — Thermistor with Bead Locations
- Vibrating Wire Piezometer Installation Level
- SB
- CSB
- Jet Grouting
- Grouting
- T min
- T current
- T max

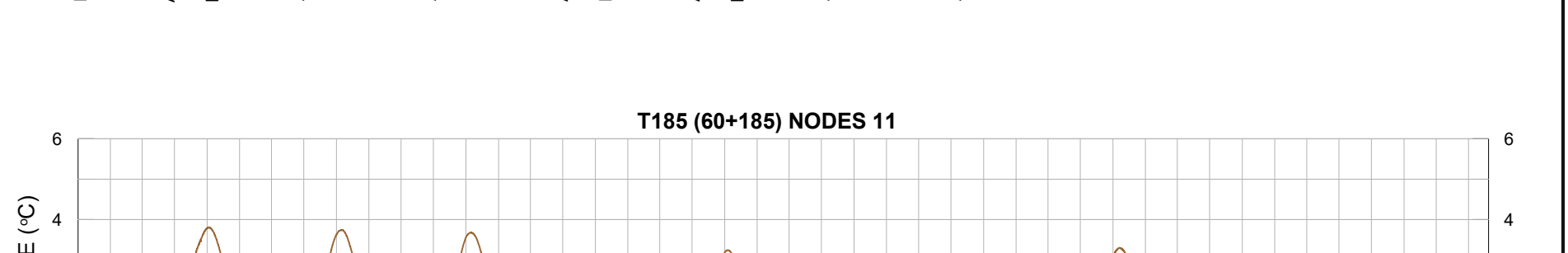
NOTES:
1.

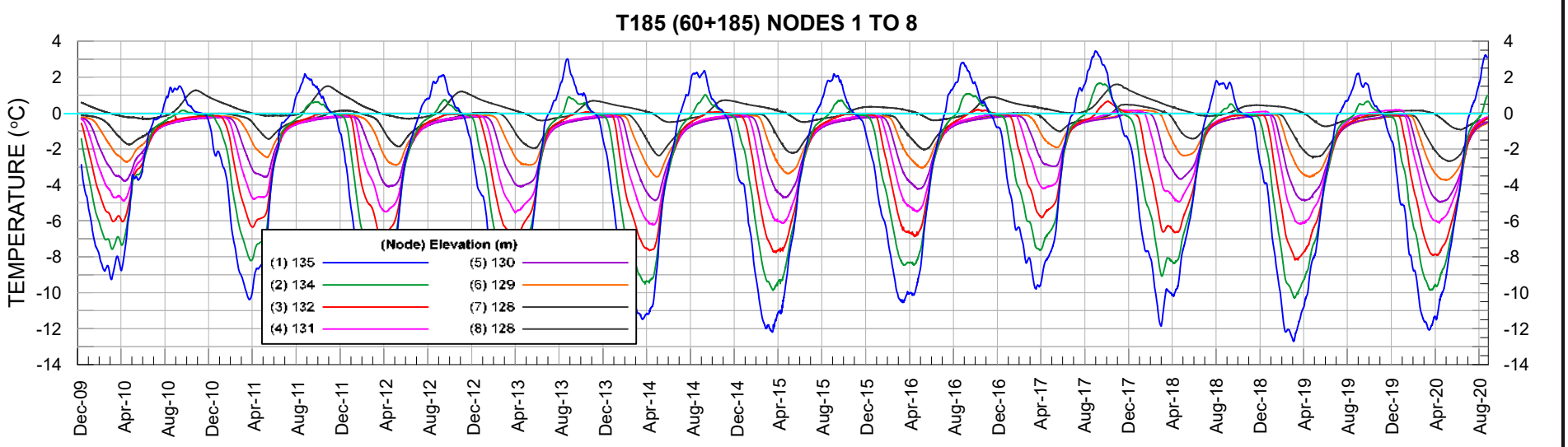
PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	EAST DIKE 60+000 to 60+350 - TEMPERATURE DATA (Aug 1/19 to Aug 27/20)

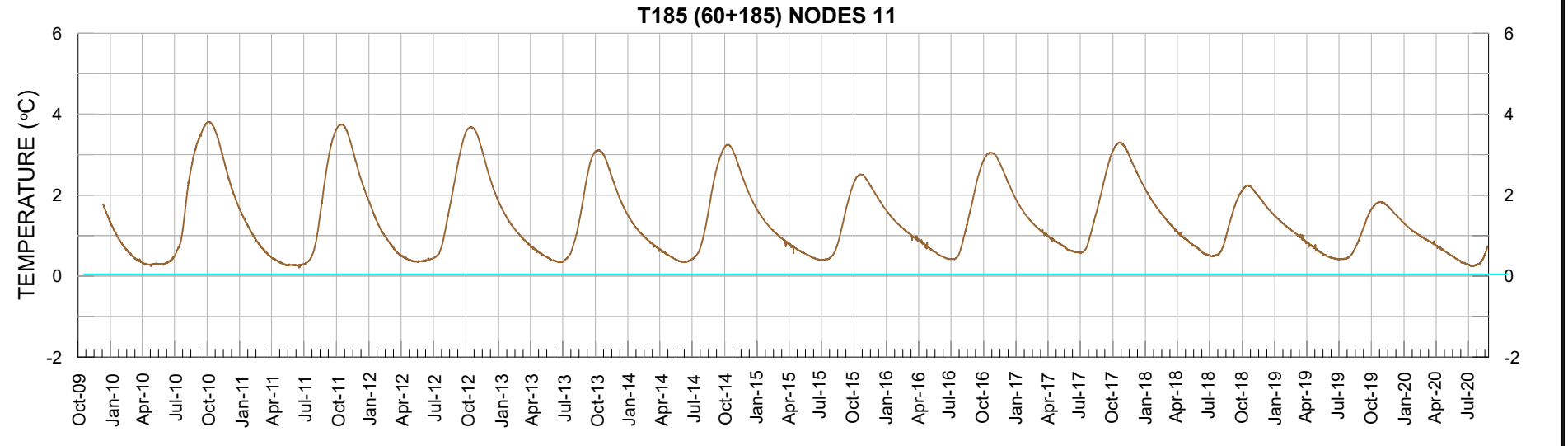
AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.		
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.	
CADD	TD	20JAN14	FIGURE 57		
CHECK					
REVIEW					







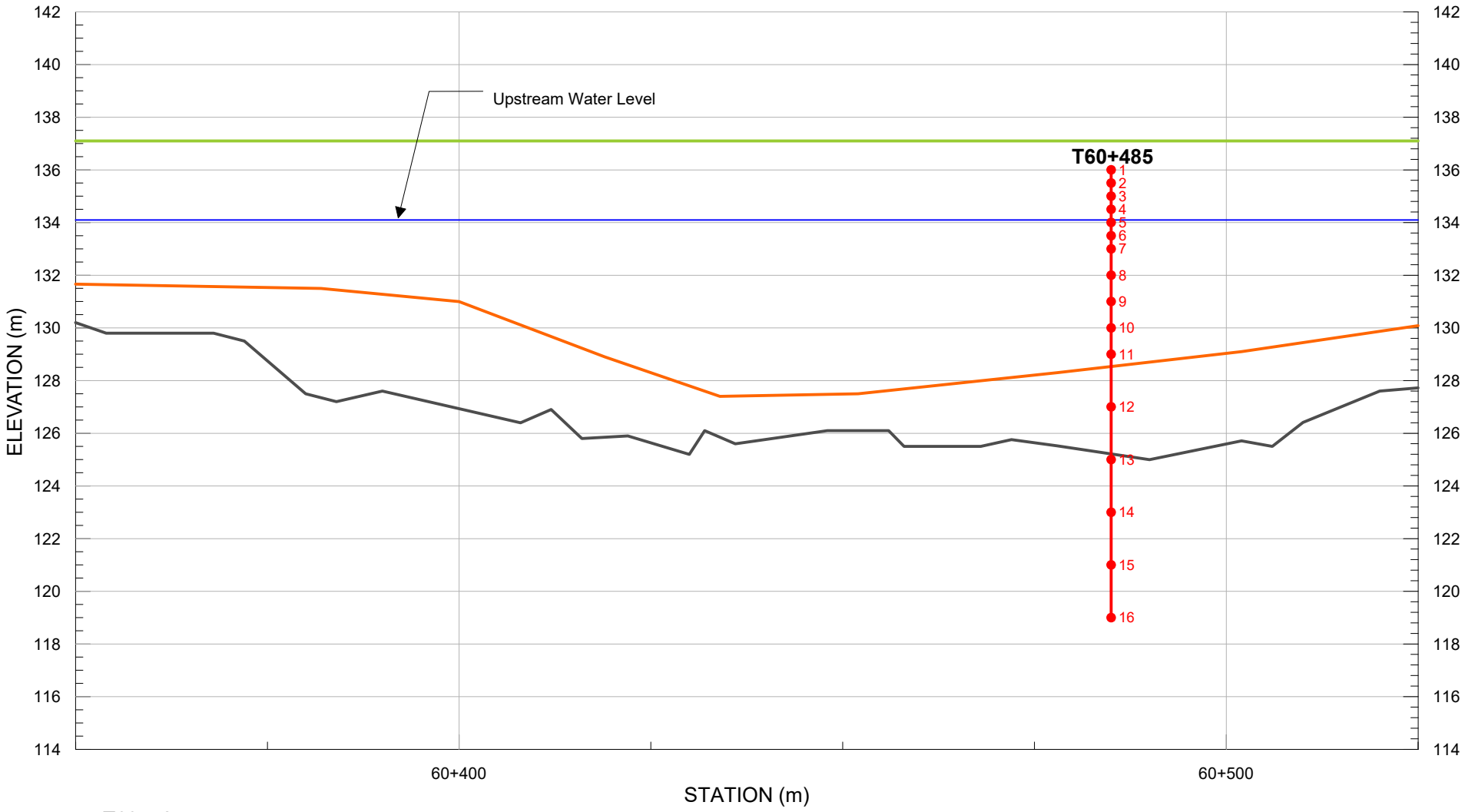


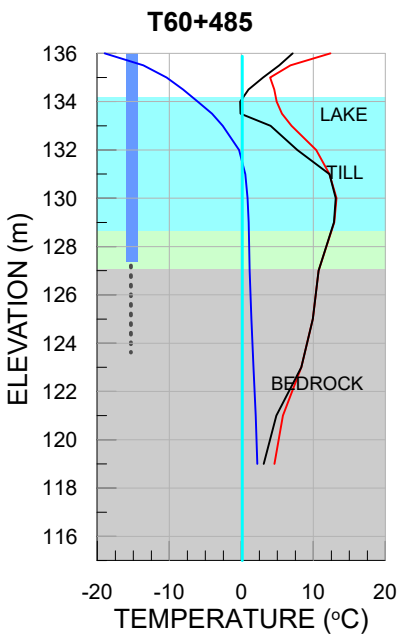
PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT				
TITLE	EAST DIKE NODAL THERMAL TIMELINES (Dec 1/09 to Aug 27/20)				
AGNICO EAGLE MEADOWBANK	PROJECT No.			PHASE No.	
	DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
	CADD	TD	20JAN14	FIGURE 58	
	CHECK				
	REVIEW				

SOUTH

"North Channel" East Dike - Longitudinal Section

NORTH





Current Temperature On August 28, 2020

LEGEND

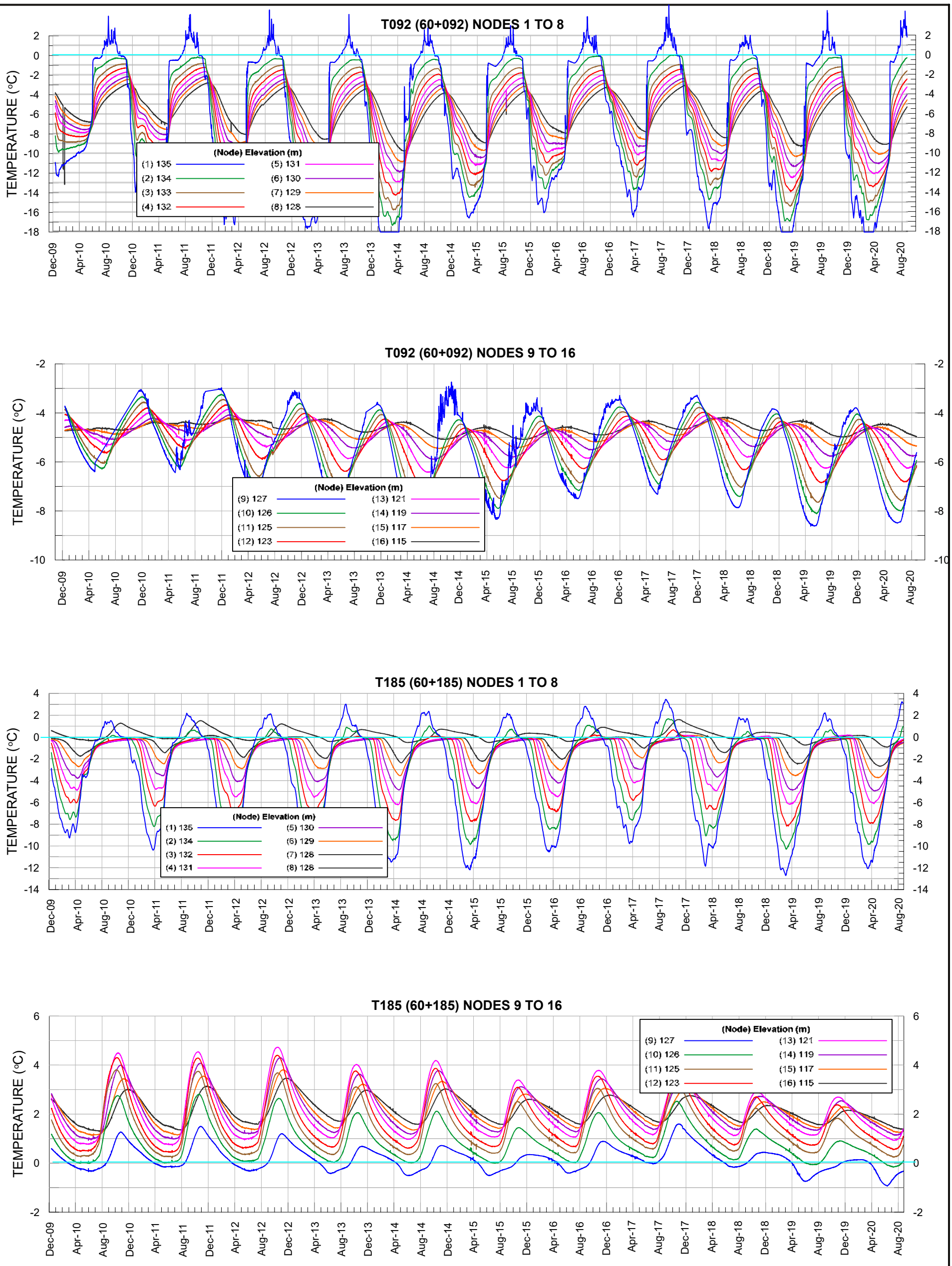
- Dike Crest
- Piezometric Head in Downstream Piezometers
- Lake Bed
- Bedrock
- Lake
- Till
- Bedrock
- 6, 7, 8, 9 — Thermistor with Bead Locations
- Vibrating Wire Piezometer Installation Level
- SB
- CSB
- Jet Grouting
- Grouting
- T min
- T current
- T max

NOTES:
1.

PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE 60+350 to 60+525 - TEMPERATURE DATA (Aug 1/19 to Aug 27/20)

AGNICO EAGLE MEADOWBANK

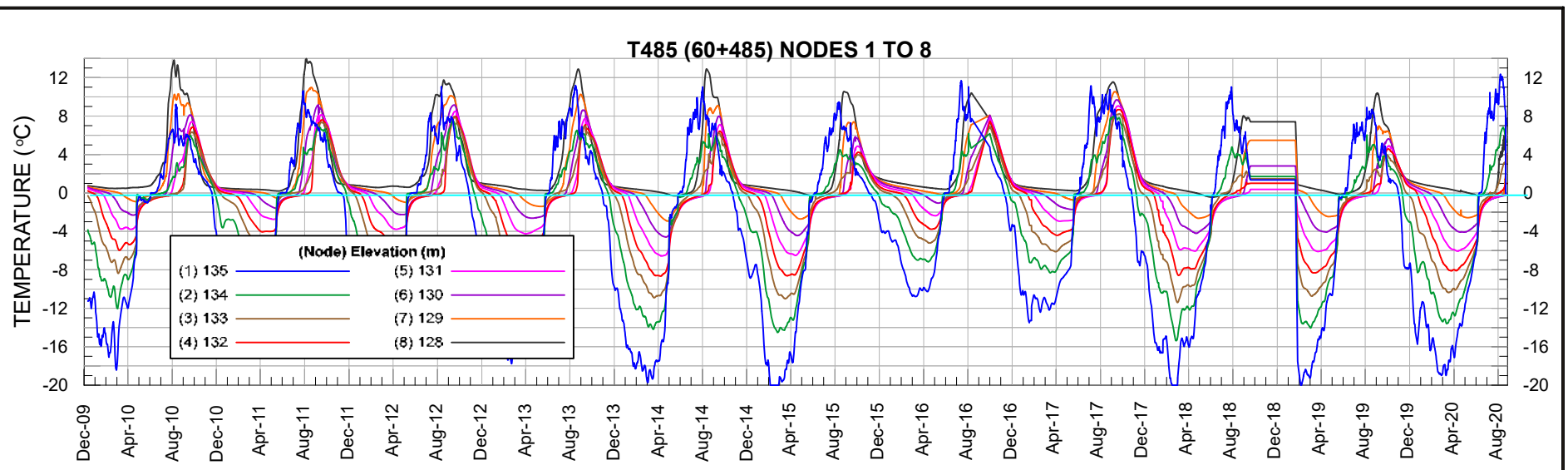
PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14		
CHECK			FIGURE 58	
REVIEW				

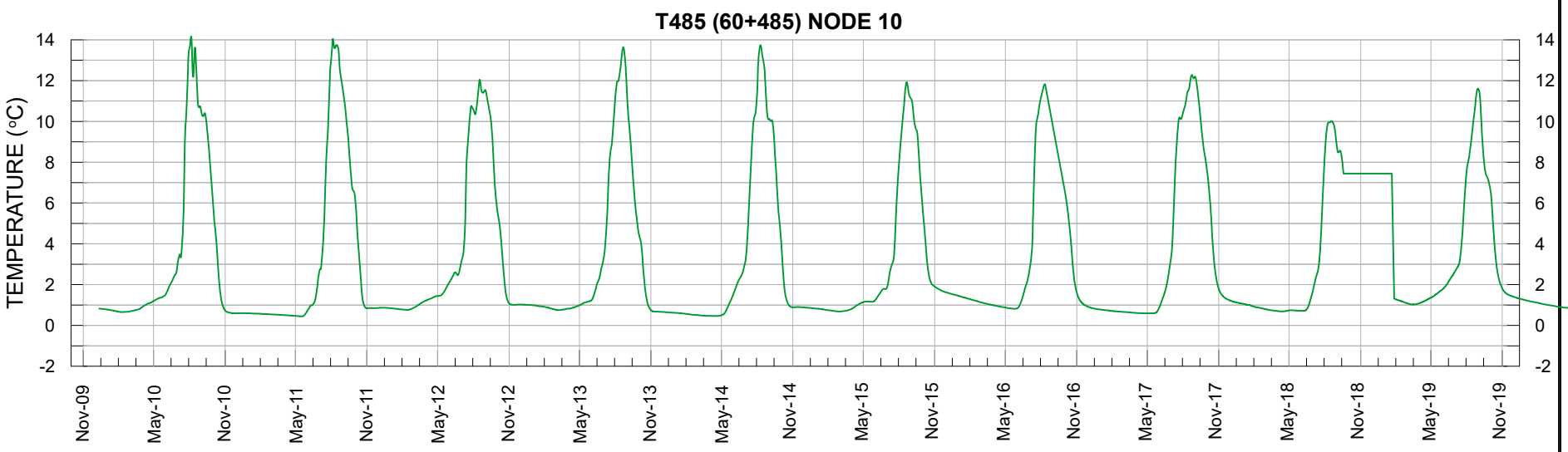


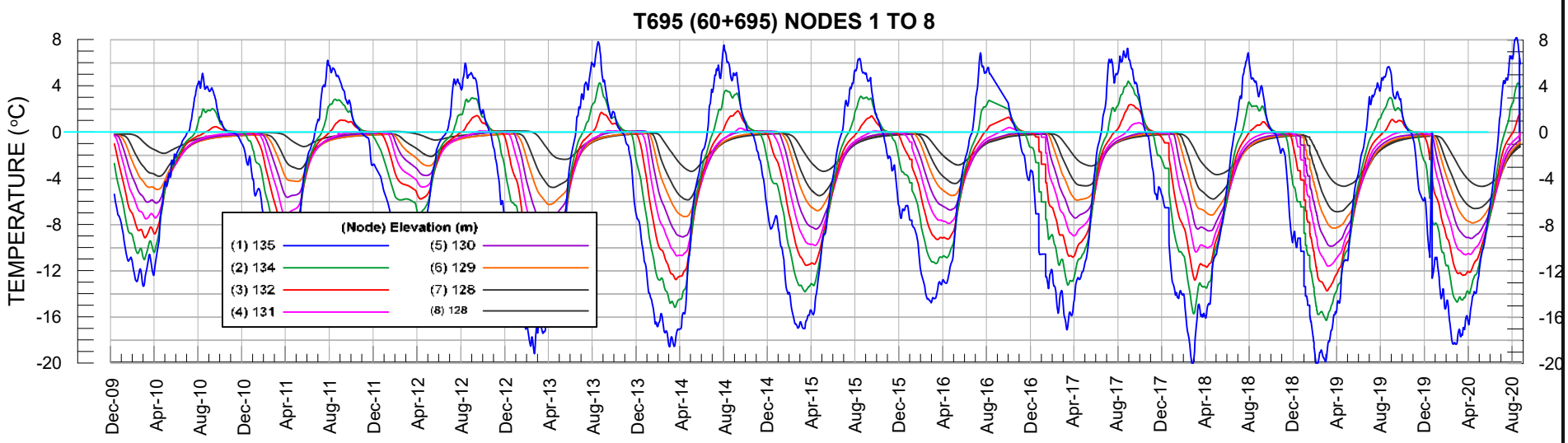
PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	EAST DIKE NODAL THERMAL TIMELINES (Dec 1/09 to Aug 27/20)

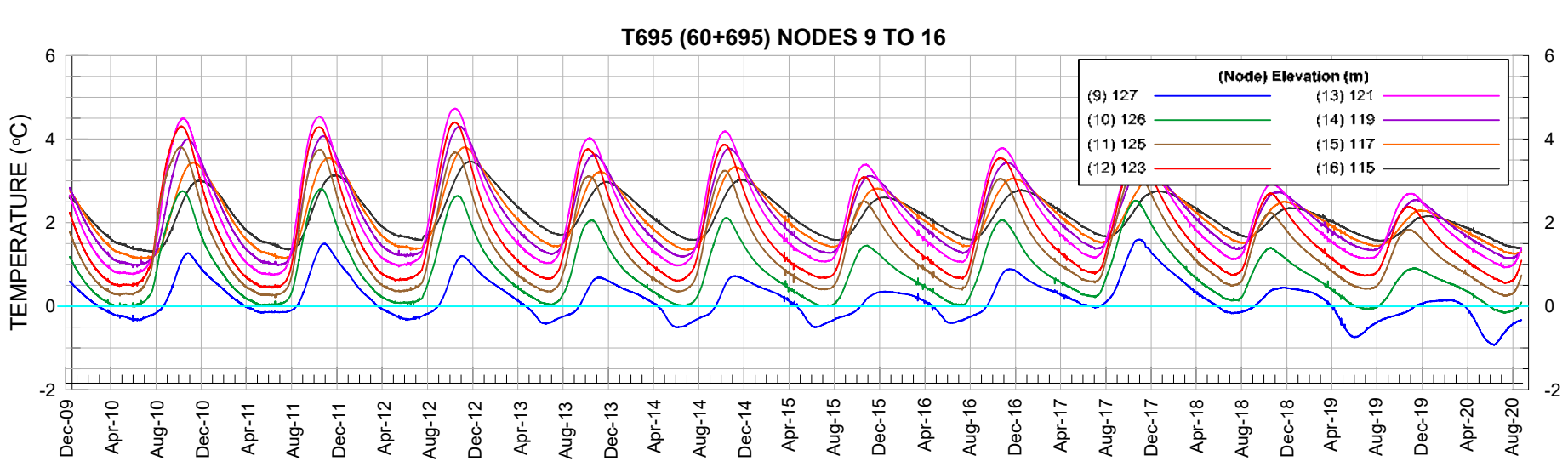
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.
DESIGN	TD	20JAN14	SCALE AS SHOWN REV.
CADD	TD	20JAN14	FIGURE 59
CHECK			
REVIEW			







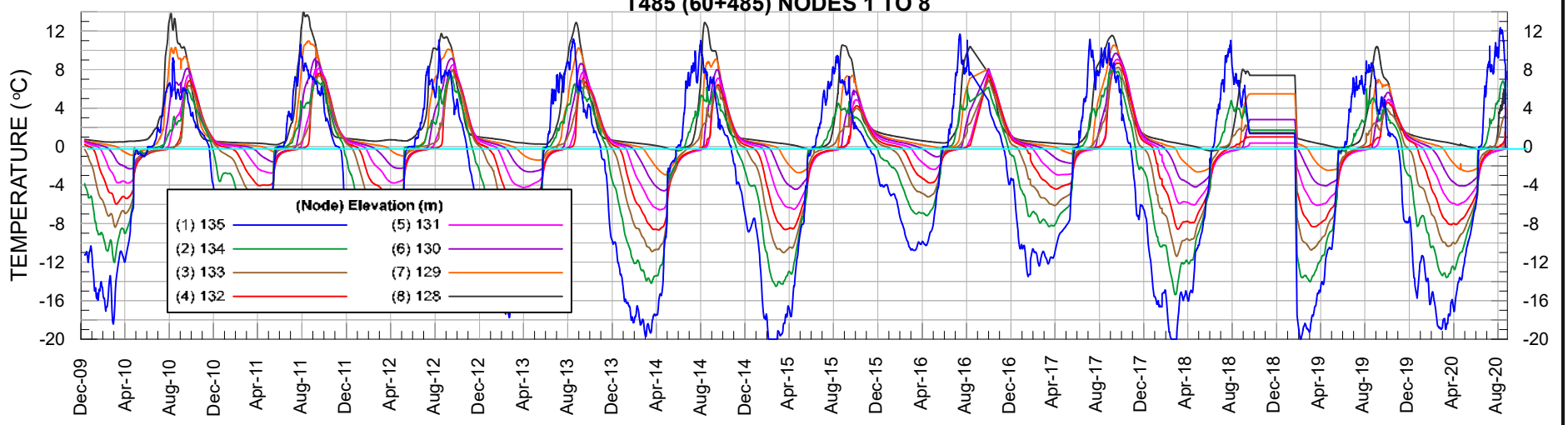


PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	EAST DIKE NODAL THERMAL TIMELINES (Dec 1/09 to Aug 27/20)

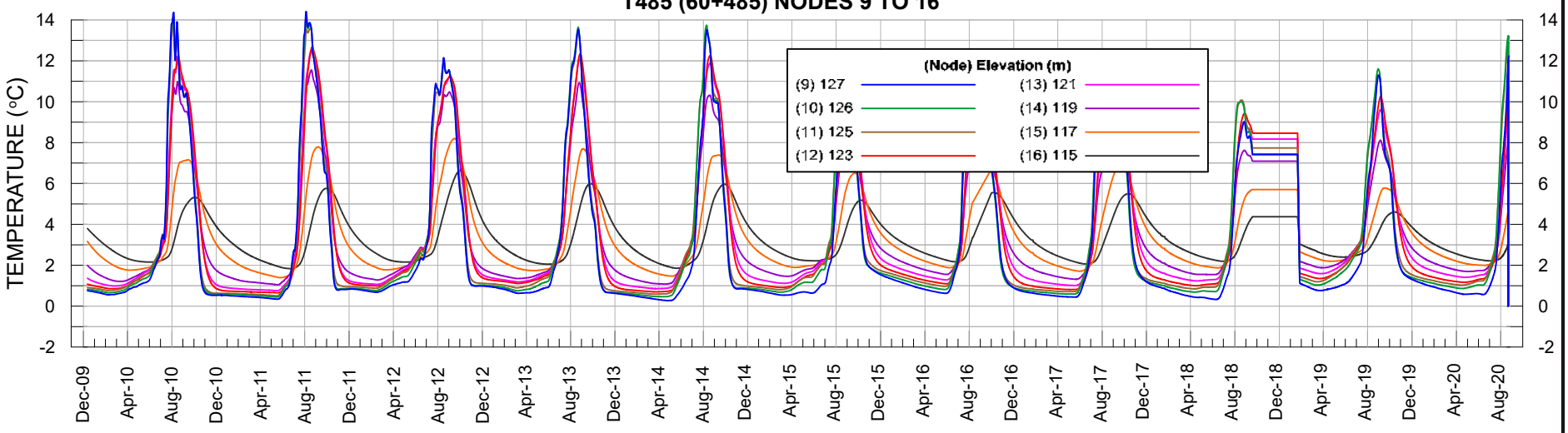
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14	FIGURE 60	
CHECK				
REVIEW				

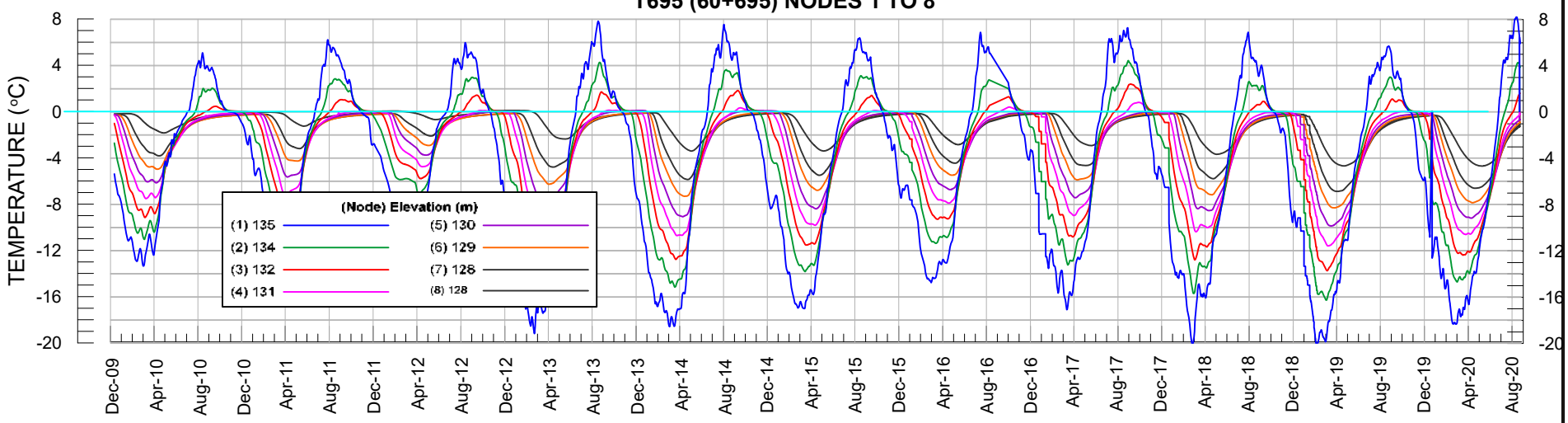
T485 (60+485) NODES 1 TO 8



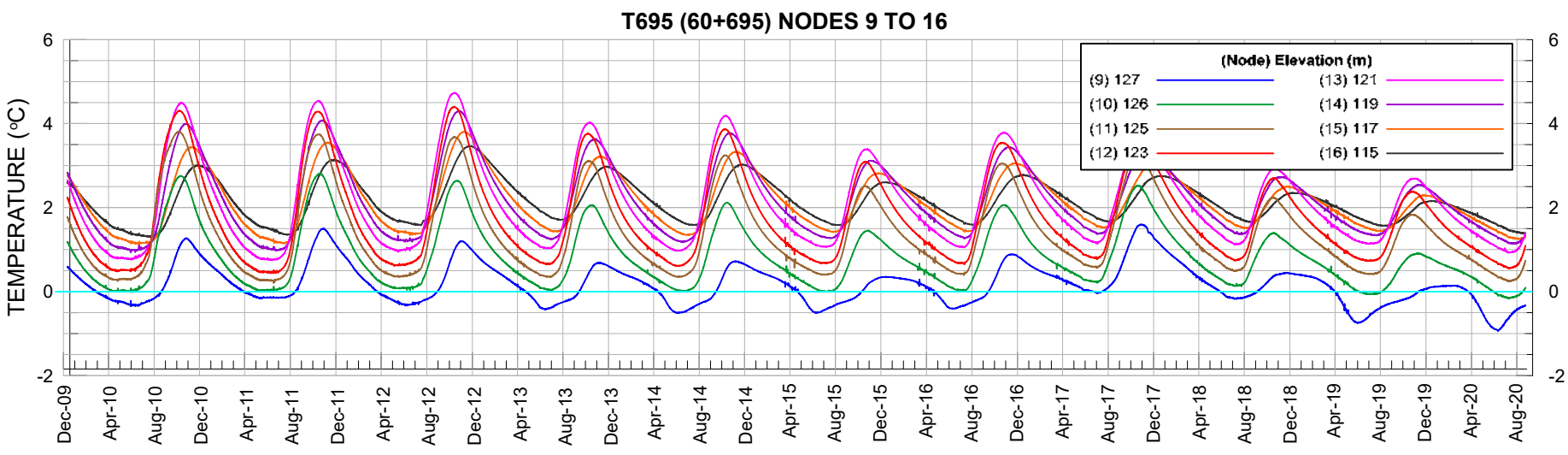
T485 (60+485) NODES 9 TO 16



T695 (60+695) NODES 1 TO 8



T695 (60+695) NODES 9 TO 16



PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	EAST DIKE NODAL THERMAL TIMELINES (Dec 1/09 to Aug 27/20)

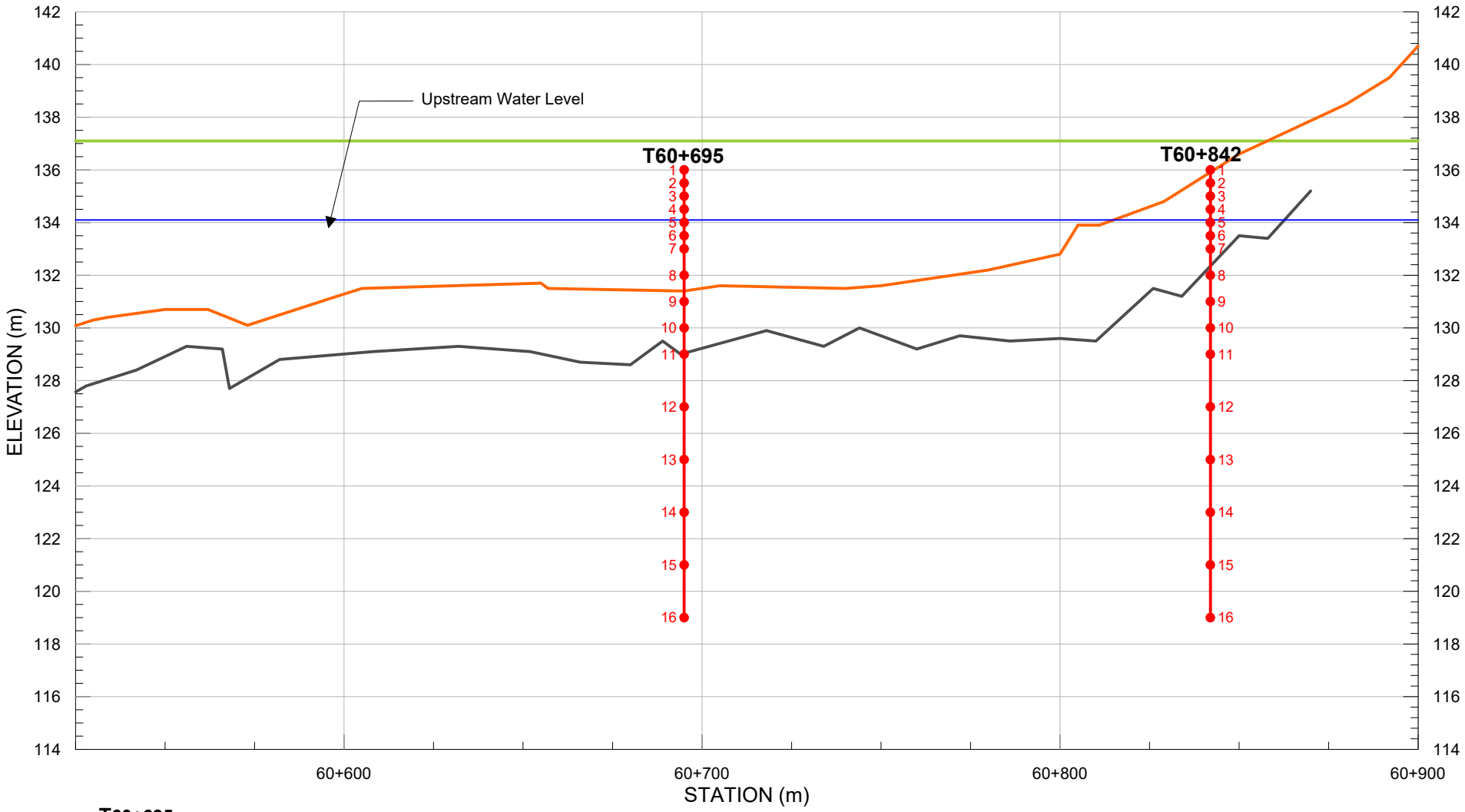
AGNICO EAGLE
MEADOWBANK

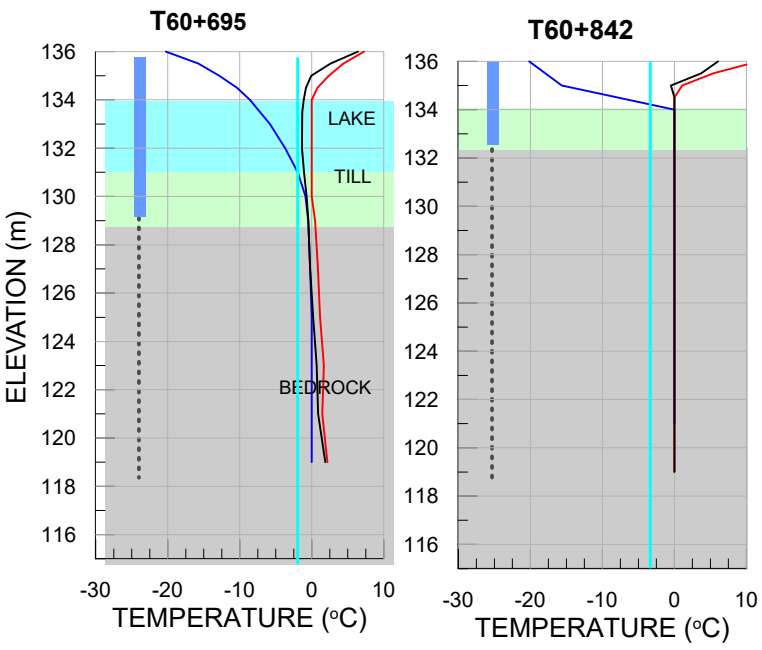
PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14	FIGURE 60	
CHECK				
REVIEW				

SOUTH

"North Channel to North Abutment" East Dike - Longitudinal Section

NORTH





Current Temperature On August 28, 2020

LEGEND

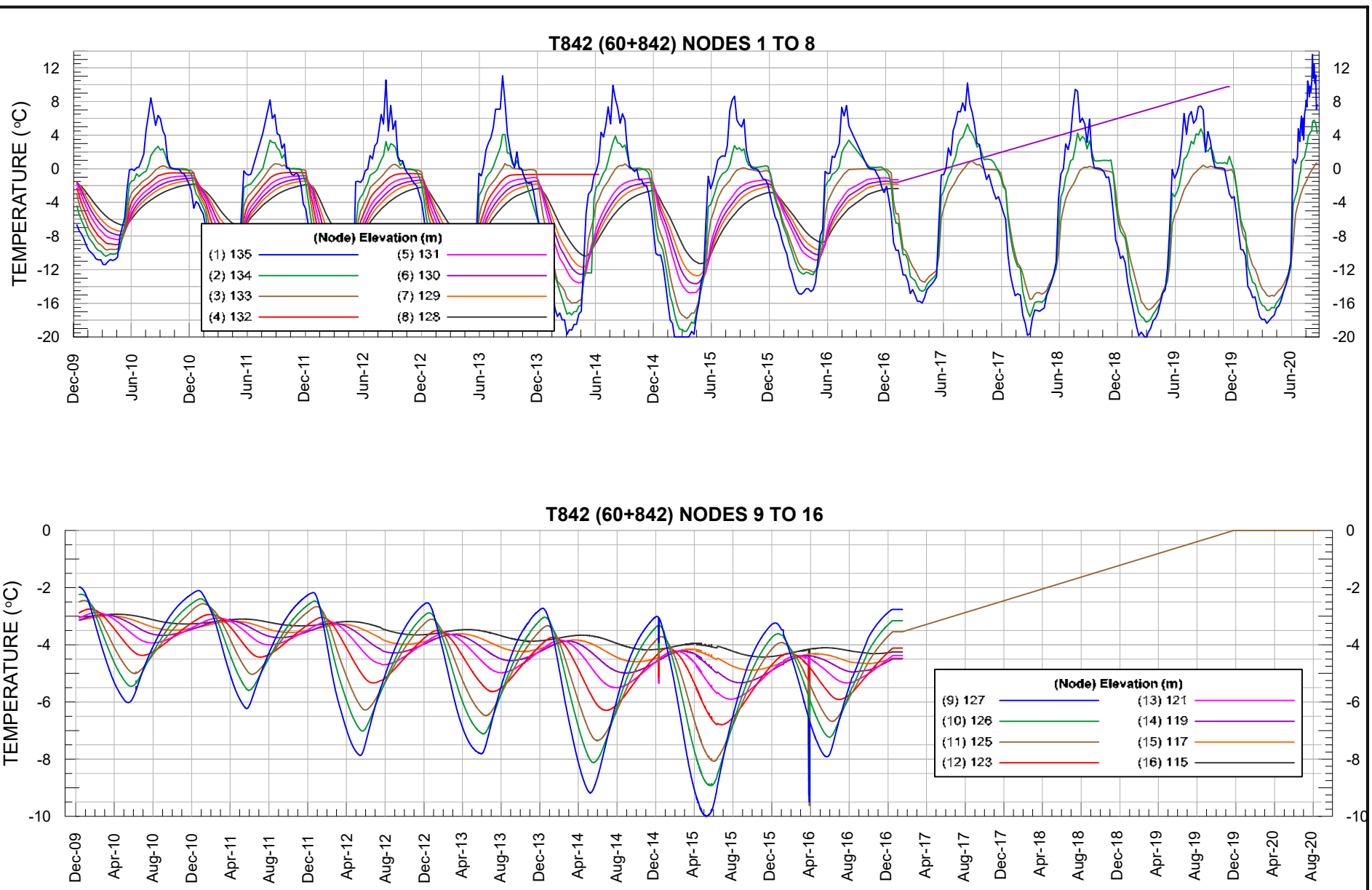
- Dike Crest
- Piezometric Head in Downstream Piezometers
- Lake Bed
- Bedrock
- Lake
- Till
- Bedrock
- 6, 7, 8, 9 — Thermistor with Bead Locations
- Vibrating Wire Piezometer Installation Level
- SB
- CSB
- Jet Grouting
- Grouting
- T min
- T current
- T max

NOTES:
1. Beads on T60+842 do not seem to be working properly.

PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	BAYGOOSE DIKE 30+000 to 30+550 - TEMPERATURE DATA (Aug 1/19 to Aug 27/20)

AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.
CADD	TD	20JAN14		
CHECK			FIGURE 61	
REVIEW				



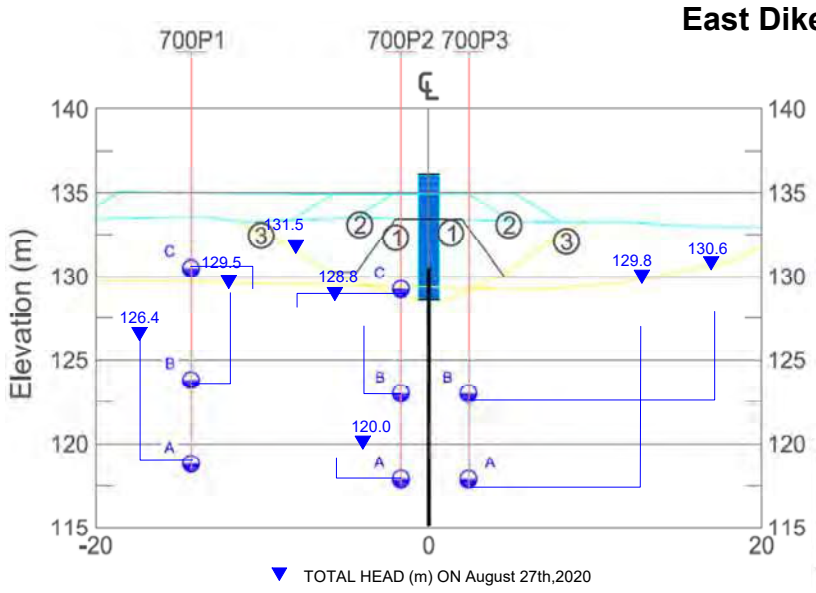
PROJECT
AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
EAST DIKE
NODAL THERMAL TIMELINES
(July 1/11 to Aug 27/20)

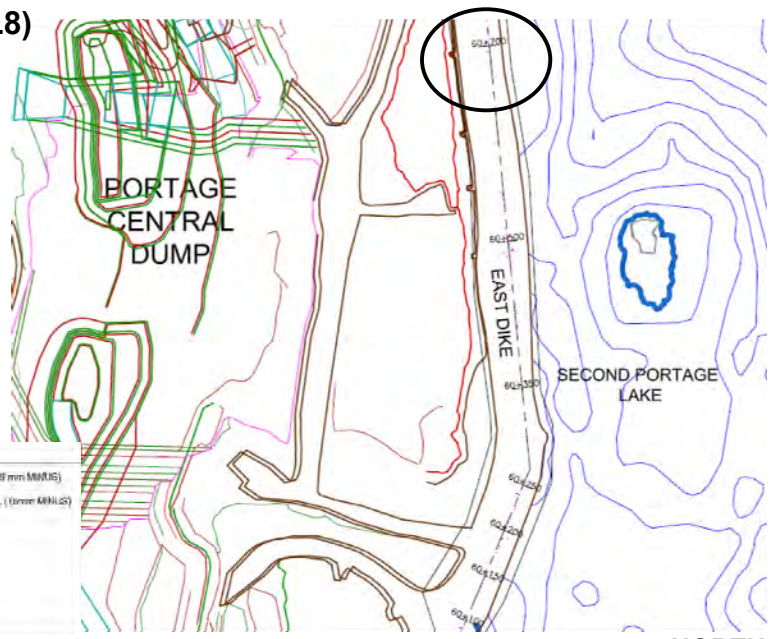
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.		
DESIGN	TD	20JAN14	SCALE AS SHOWN	REV.	
CADD	TD	20JAN14			
CHECK			**FIGURE 62**		
REVIEW					

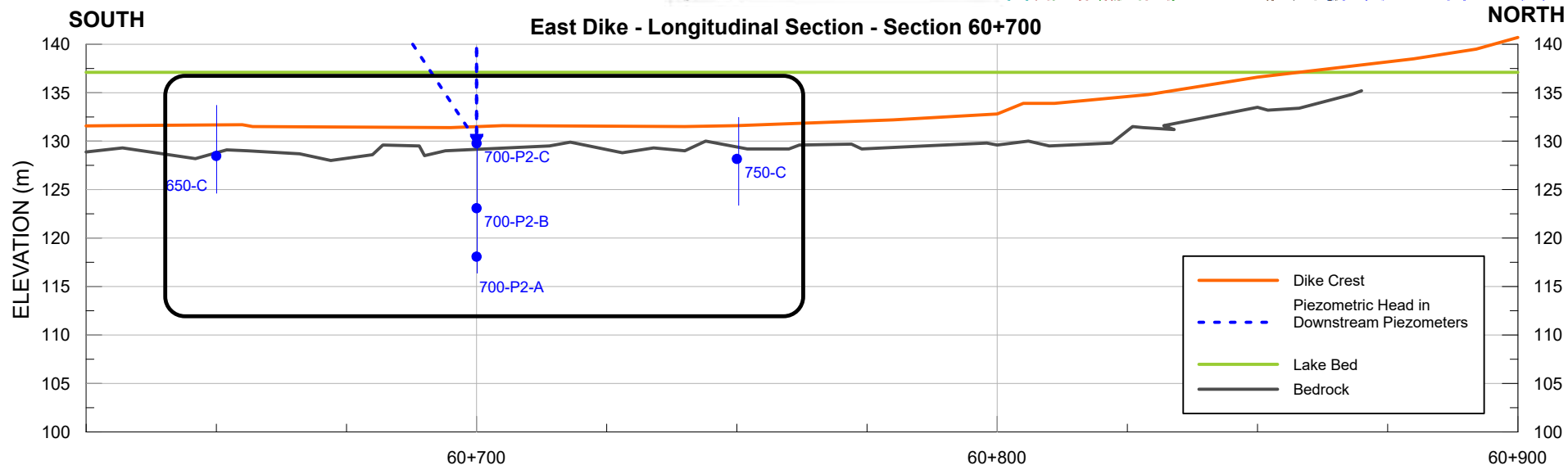
East Dike - Section 60+700 (DL8)



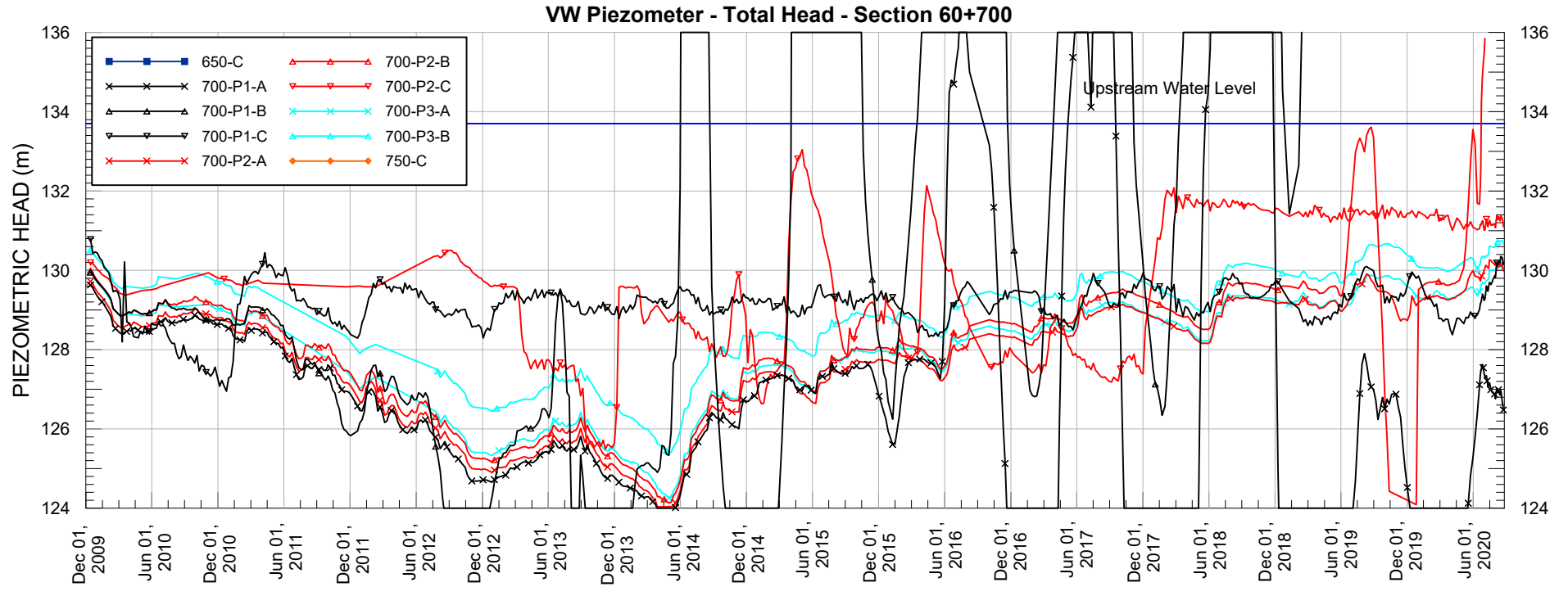




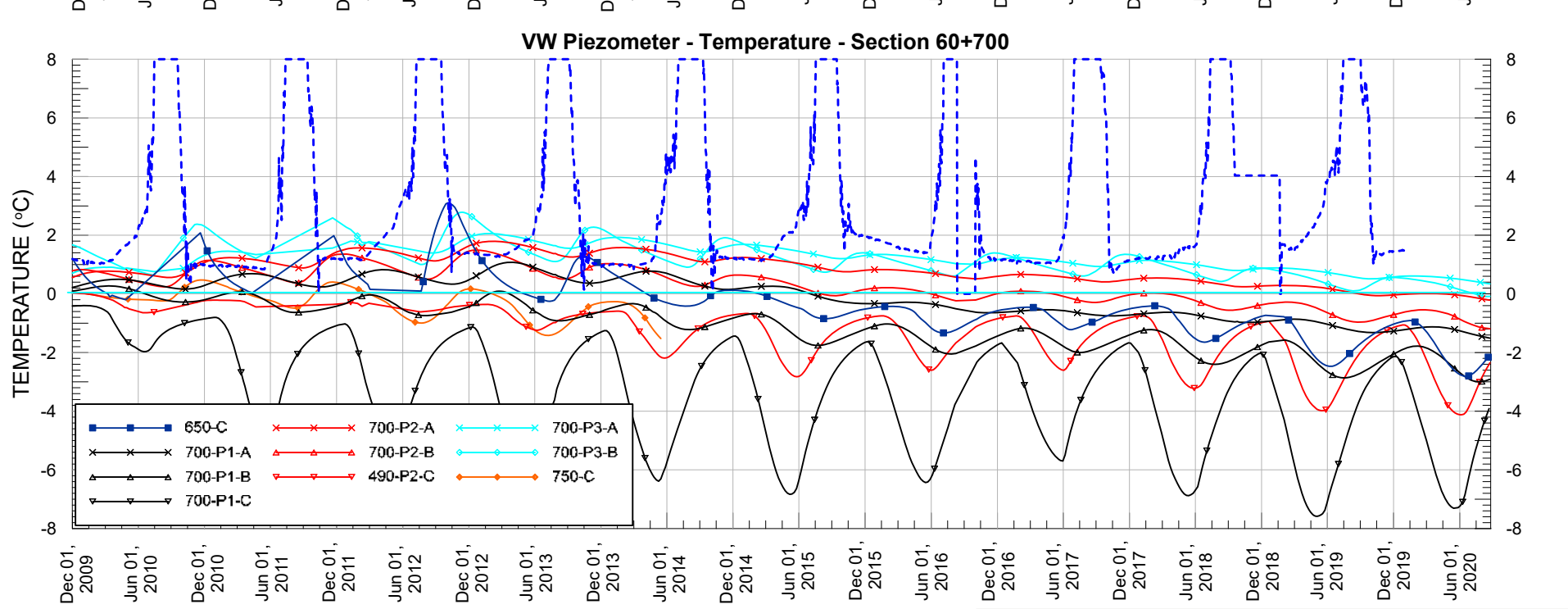
East Dike - Longitudinal Section - Section 60+700



VW Piezometer - Total Head - Section 60+700



VW Piezometer - Temperature - Section 60+700



NOTES:
1: 700-P1-B and 750-C are giving unreliable readings and with a negative temperature are assumed to be frozen and data not cosinder reliable.

PROJECT
AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE
EAST DIKE
Section 60+700 - PIEZOMETRIC DATA
(Dec 1/09 to Aug 27/20)

AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	FIGURE 31	
REVIEW				

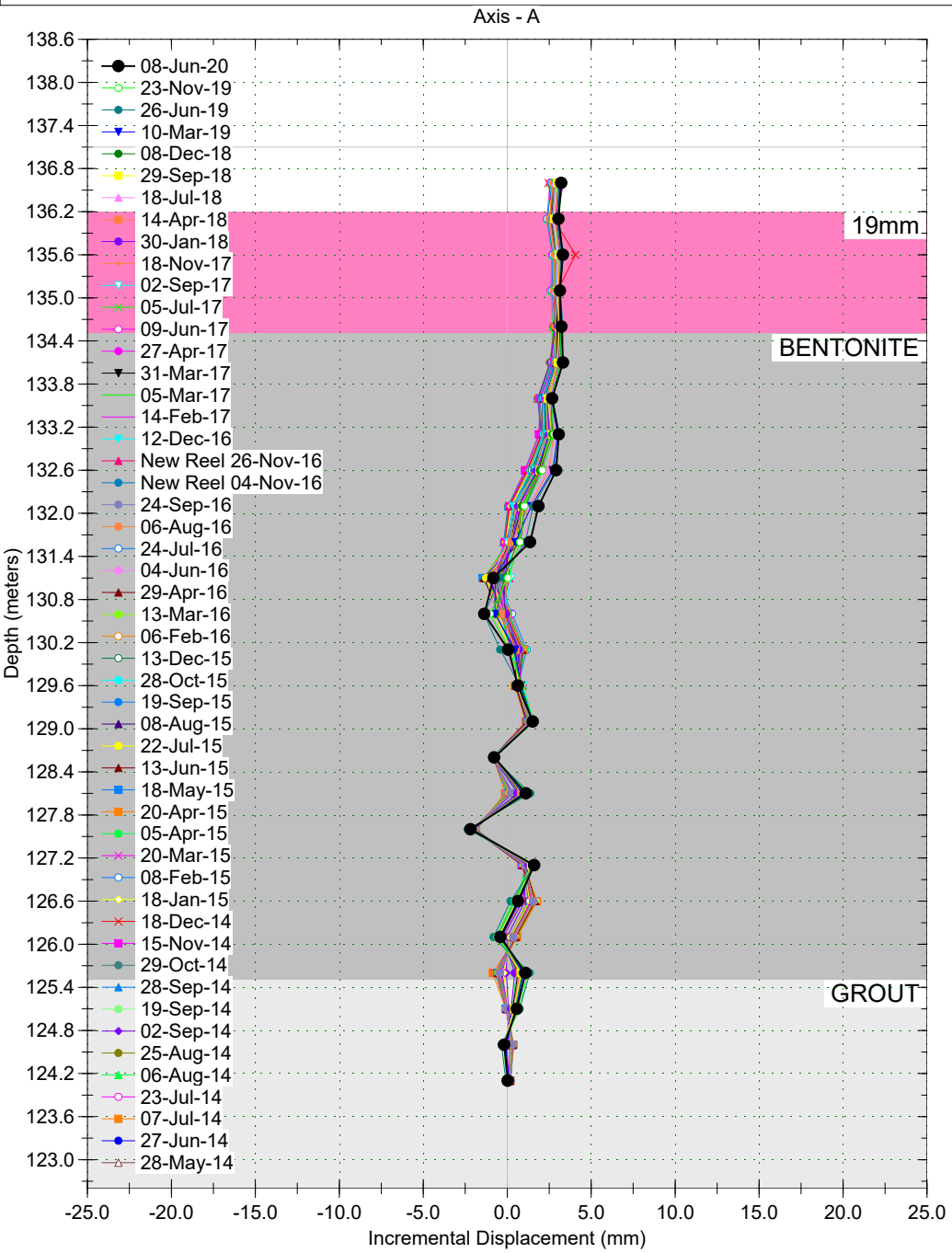
RST Instruments Ltd.

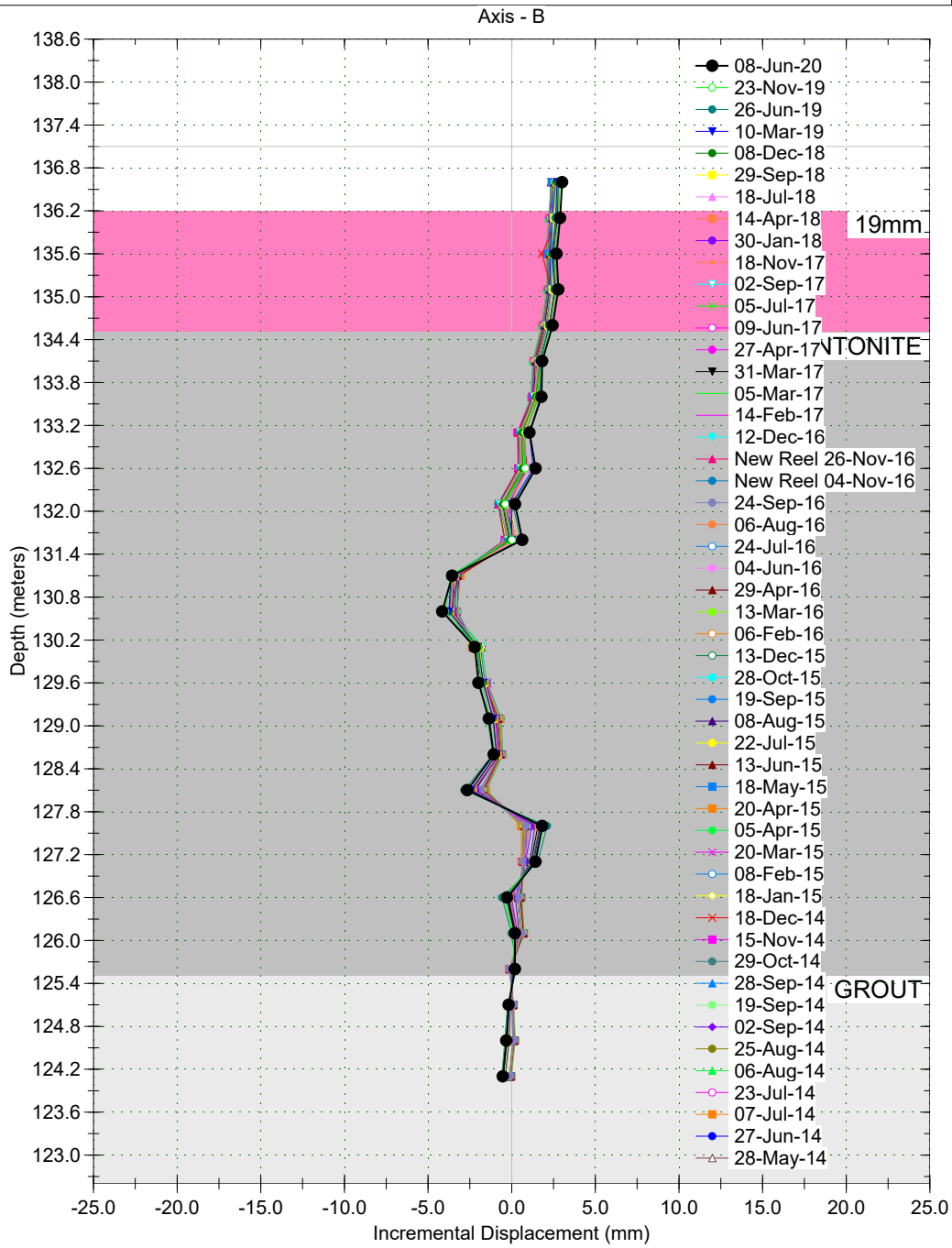
INCREMENTAL DISPLACEMENT

Inclinalysis v. 2.48.7

Borehole : ED-IN-495
Project : Inclinalysis
Location : 60+495
Northing : 7214150.527
Easting : 639371.137
Collar : 137.098

Spiral Correction : N/A
Collar Elevation : :137.10 meters
Reading Depth : 13.0 meters
A+ Groove Azimuth :
Base Reading : 2009 Jun 08 11:21
Applied Azimuth : 0.0 degrees





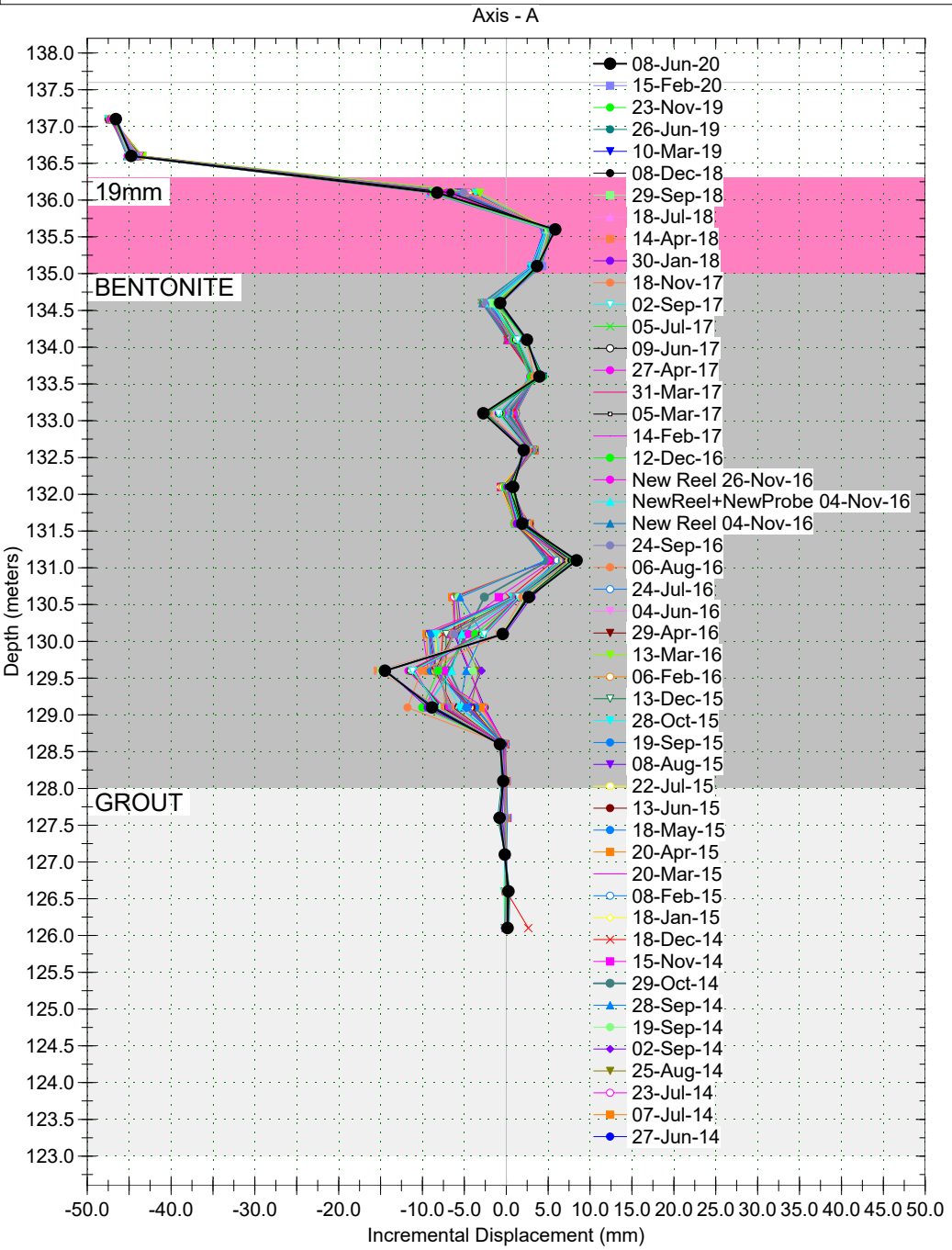
RST Instruments Ltd.

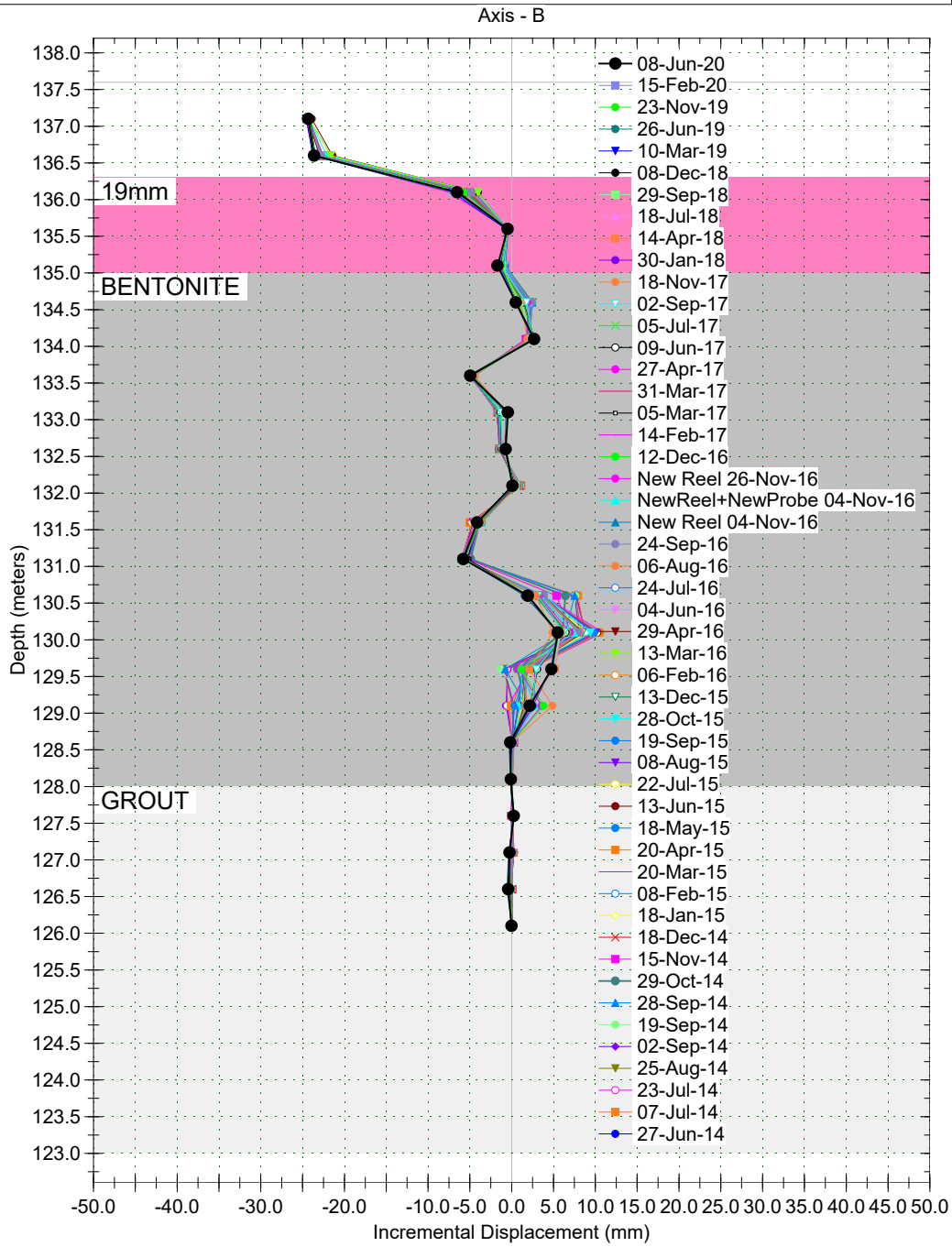
INCREMENTAL DISPLACEMENT

Inclinalysis v. 2.48.7

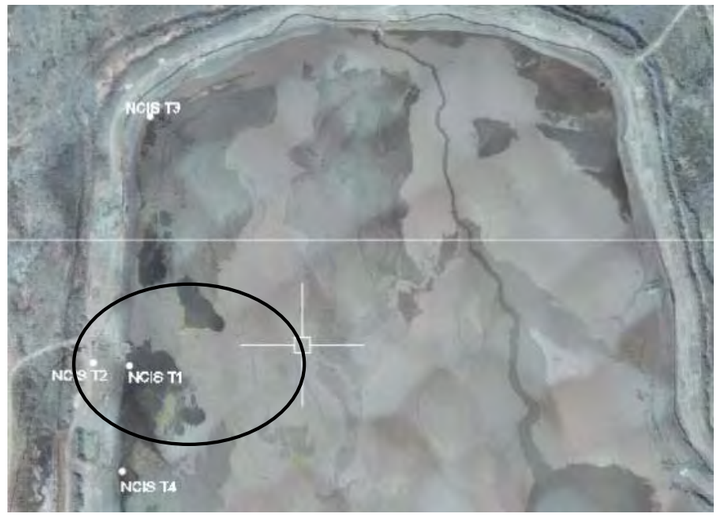
Borehole : ED-IN-705
Project : Inclinalysis
Location : 60+705
Northing : 7214359.592
Easting : 639351.466
Collar : 137.589

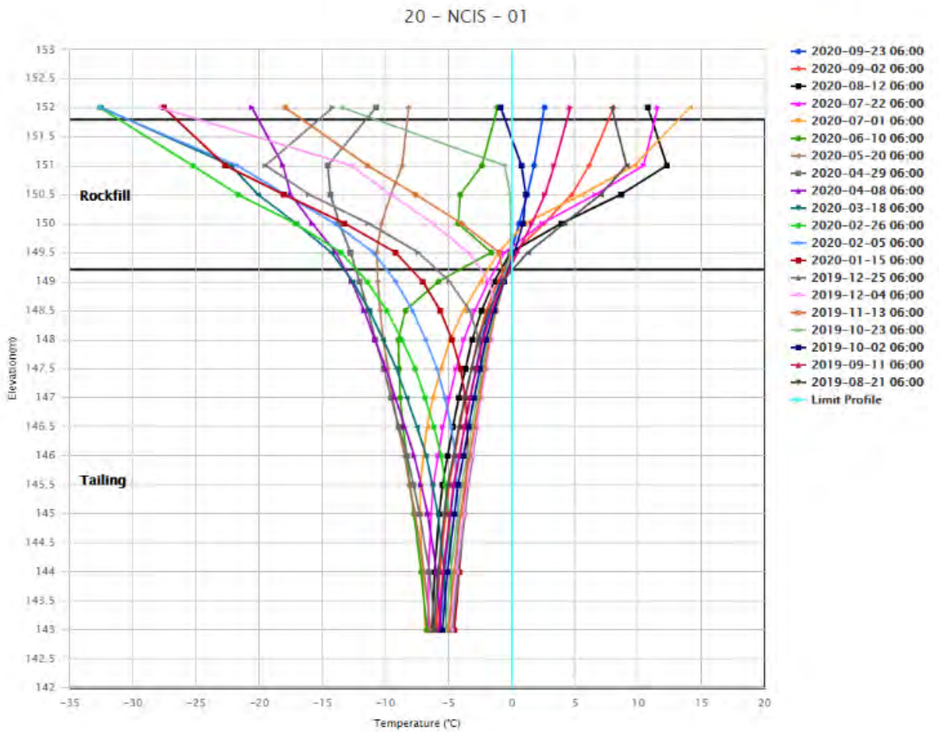
Spiral Correction : N/A
Collar Elevation : :137.60 meters
Reading Depth : 11.5 meters
A+ Groove Azimuth :
Base Reading : 2009 Jun 23 11:13
Applied Azimuth : 0.0 degrees

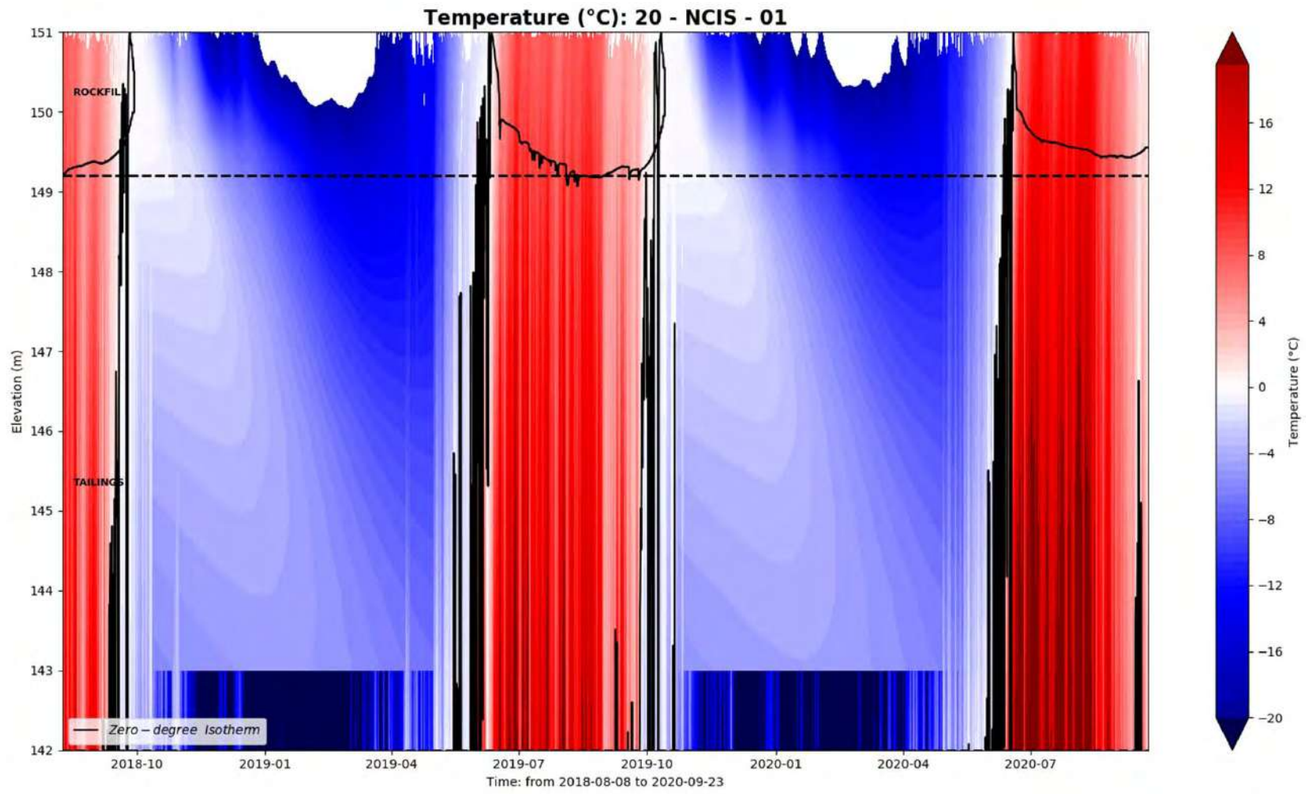


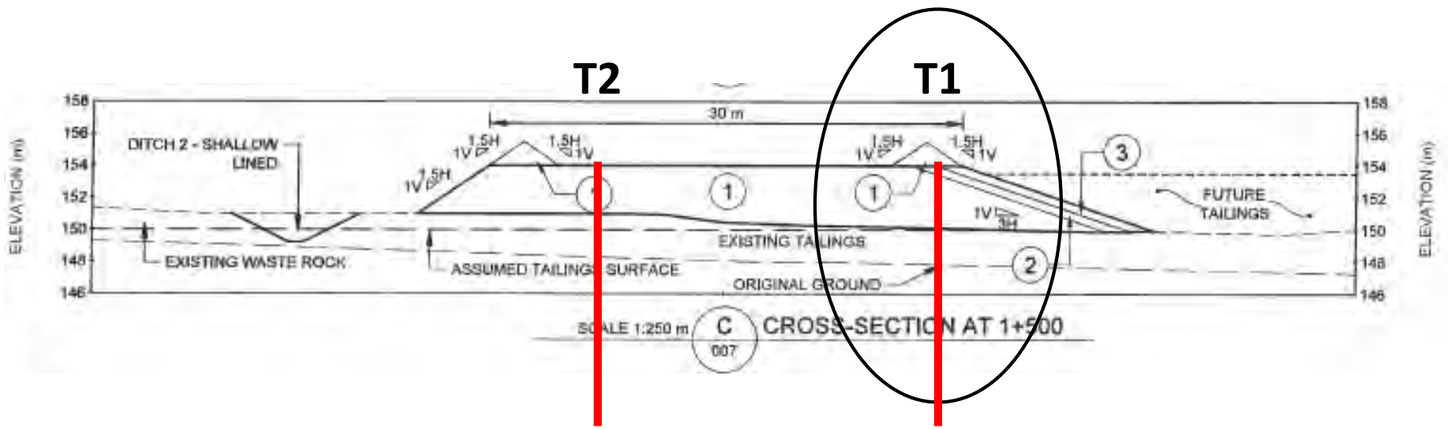


NCIS T1


NCIS T3
NCIS T2
NCIS T1
NCIS T4

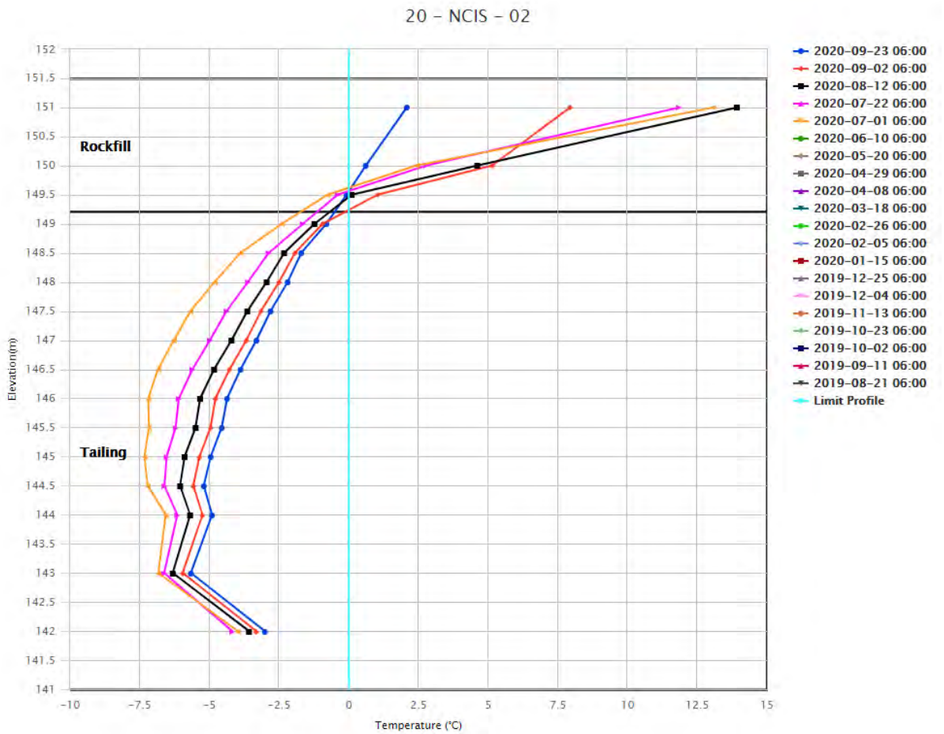

20 – NCIS – 01
Rockfill
Tailing
Elevation(m)
Temperature (°C)
2020-09-23 06:00
2020-09-02 06:00
2020-08-12 06:00
2020-07-22 06:00
2020-07-01 06:00
2020-06-10 06:00
2020-05-20 06:00
2020-04-29 06:00
2020-04-08 06:00
2020-03-18 06:00
2020-02-26 06:00
2020-02-05 06:00
2020-01-15 06:00
2019-12-25 06:00
2019-12-04 06:00
2019-11-13 06:00
2019-10-23 06:00
2019-10-02 06:00
2019-09-11 06:00
2019-08-21 06:00
Limit Profile

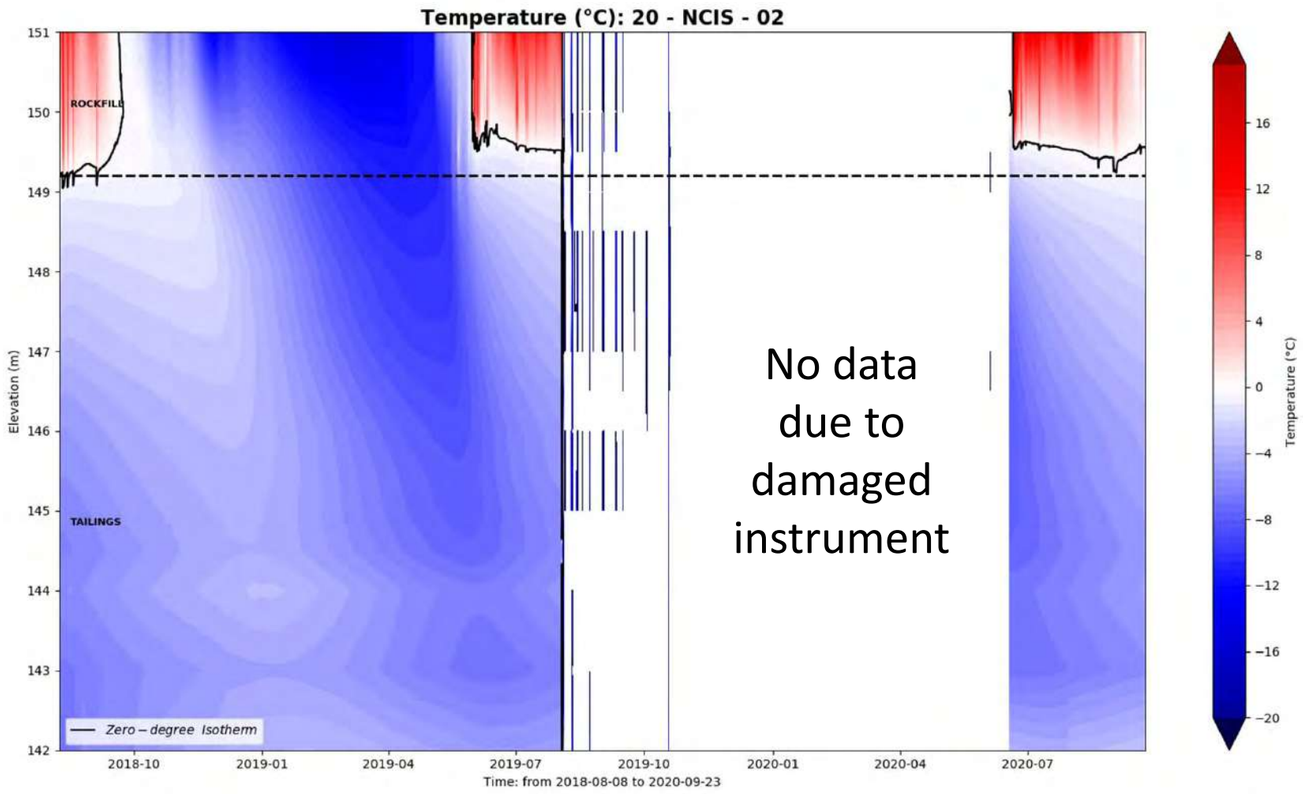

Temperature (°C): 20 - NCIS - 01
ROCKFILL
TAILINGS
Zero – degree Isotherm
Elevation (m)
Temperature (°C)
Time: from 2018-08-08 to 2020-09-23

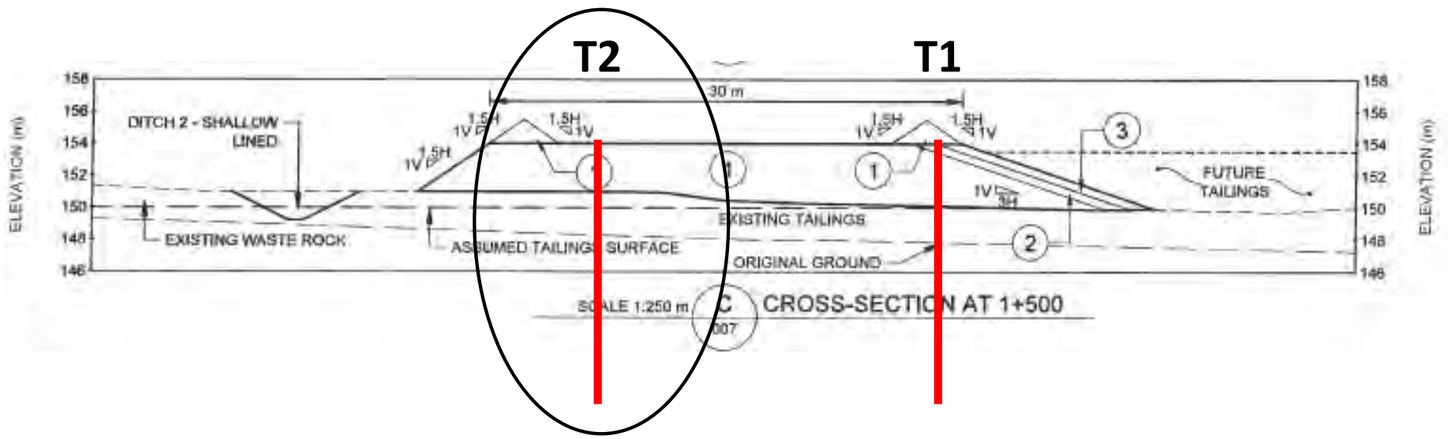

T2
T1
30 m
DITCH 2 - SHALLOW LINED
EXISTING WASTE ROCK
ASSUMED TAILINGS SURFACE
EXISTING TAILINGS
ORIGINAL GROUND
FUTURE TAILINGS
SCALE 1:250 m
C
007
CROSS-SECTION AT 1+500
ELEVATION (m)

NCIS T2


NCIS T3
NCIS T2
NCIS T1
NCIS T4

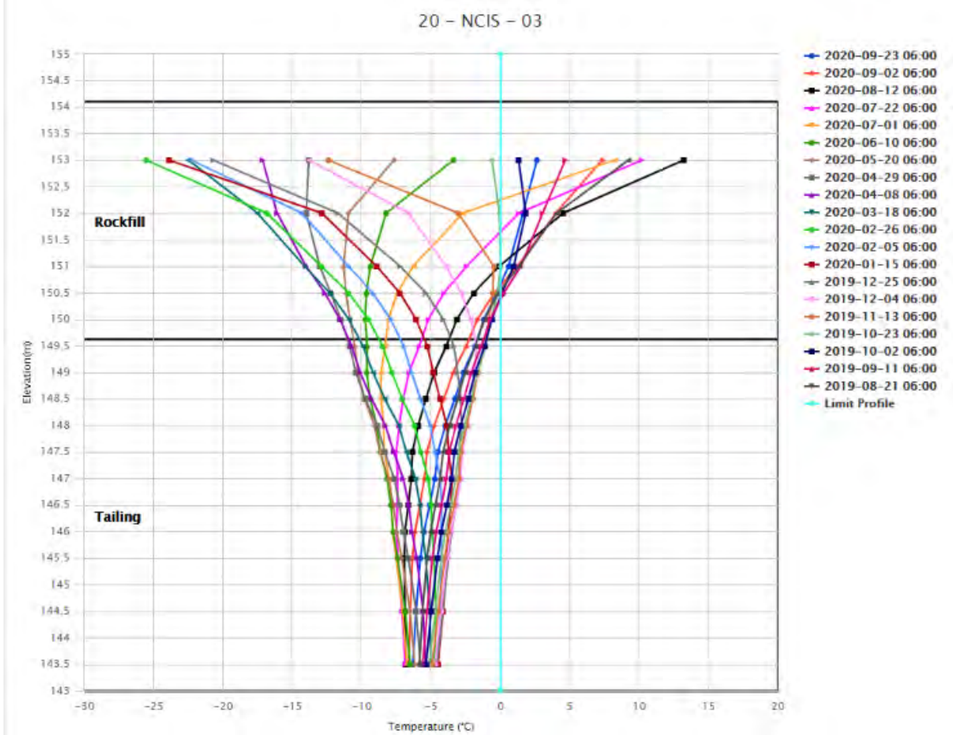

20 – NCIS – 02
Rockfill
Tailing
Elevation(m)
Temperature (°C)
2020-09-23 06:00
2020-09-02 06:00
2020-08-12 06:00
2020-07-22 06:00
2020-07-01 06:00
2020-06-10 06:00
2020-05-20 06:00
2020-04-29 06:00
2020-04-08 06:00
2020-03-18 06:00
2020-02-26 06:00
2020-02-05 06:00
2020-01-15 06:00
2019-12-25 06:00
2019-12-04 06:00
2019-11-13 06:00
2019-10-23 06:00
2019-10-02 06:00
2019-09-11 06:00
2019-08-21 06:00
Limit Profile

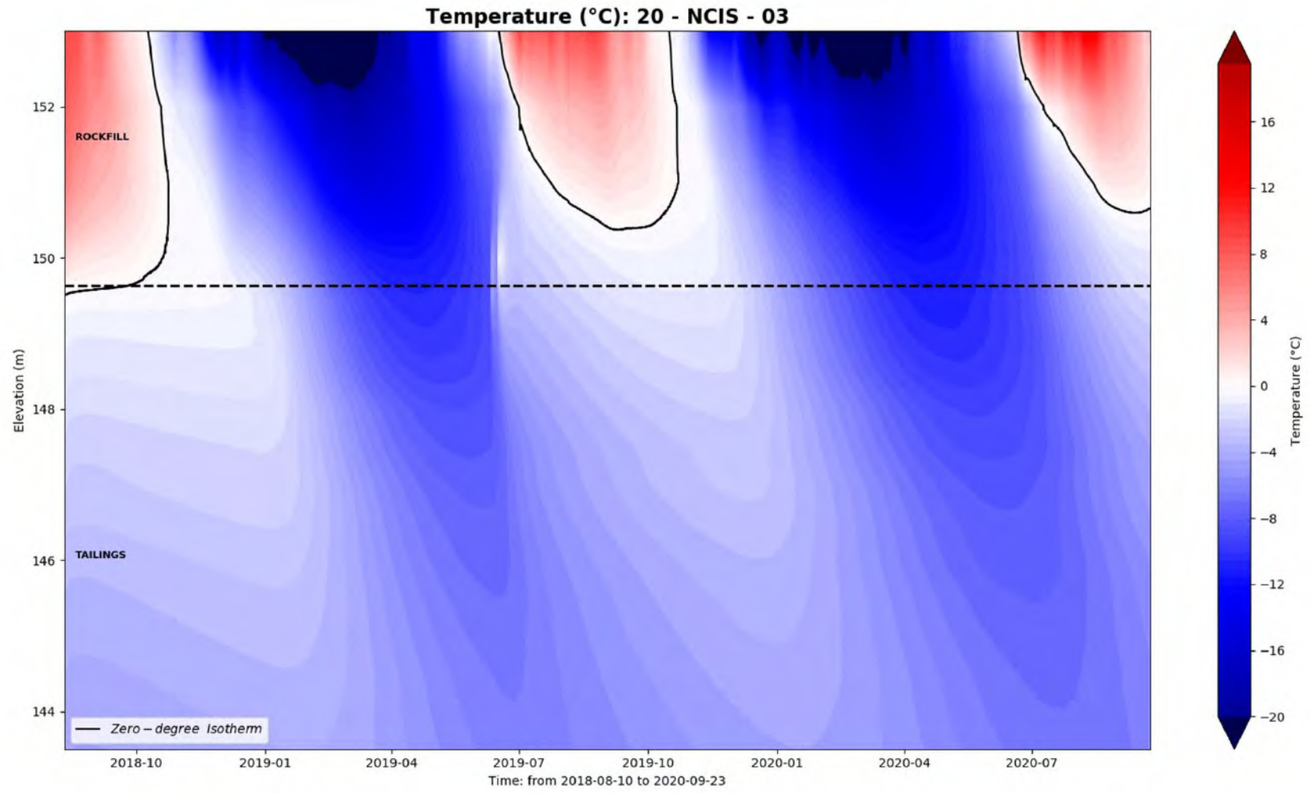

Temperature (°C): 20 - NCIS - 02
ROCKFILL
TAILINGS
Zero – degree Isotherm
Elevation (m)
Time: from 2018-08-08 to 2020-09-23
Temperature (°C)
No data due to damaged instrument

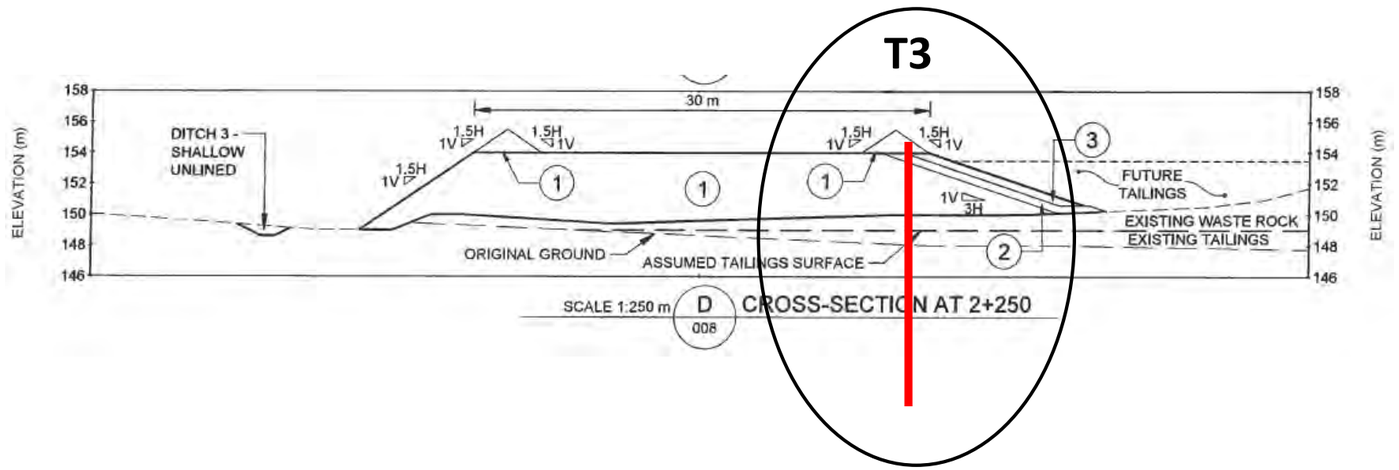

T2
T1
30 m
DITCH 2 - SHALLOW LINED
EXISTING WASTE ROCK
ASSUMED TAILINGS SURFACE
EXISTING TAILINGS
ORIGINAL GROUND
FUTURE TAILINGS
ELEVATION (m)
SCALE 1:250 m
CROSS-SECTION AT 1+500

NCIS T3


NCIS T3
NCIS T2
NCIS T1
NCIS T4

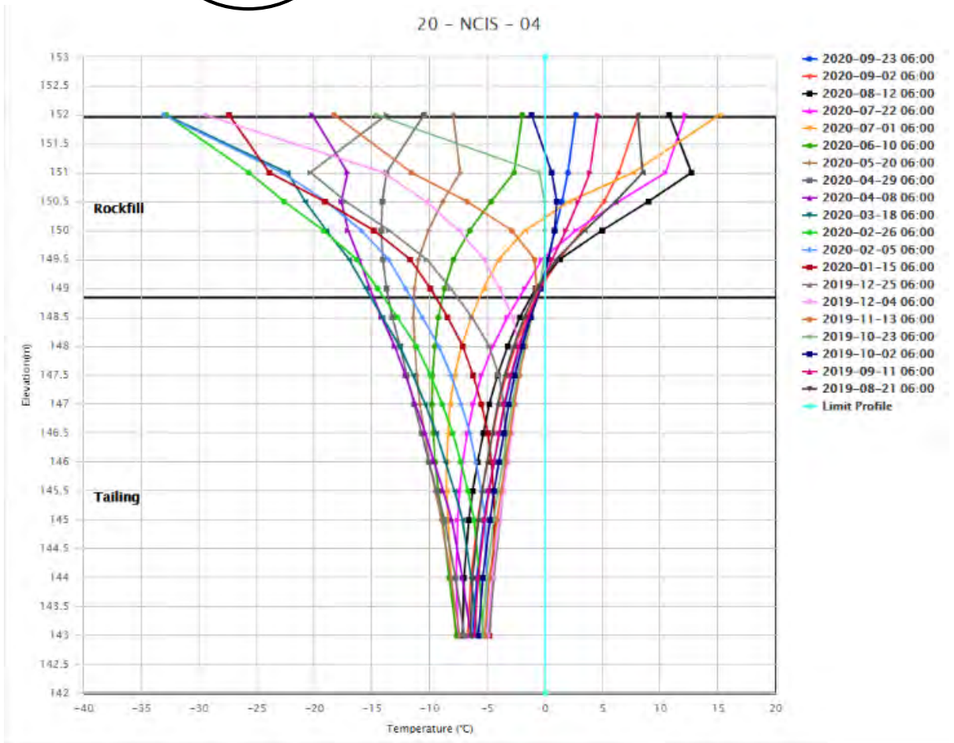

20 – NCIS – 03
Rockfill
Tailing
Elevation(m)
Temperature (°C)
2020-09-23 06:00
2020-09-02 06:00
2020-08-12 06:00
2020-07-22 06:00
2020-07-01 06:00
2020-06-10 06:00
2020-05-20 06:00
2020-04-29 06:00
2020-04-08 06:00
2020-03-18 06:00
2020-02-26 06:00
2020-02-05 06:00
2020-01-15 06:00
2019-12-25 06:00
2019-12-04 06:00
2019-11-13 06:00
2019-10-23 06:00
2019-10-02 06:00
2019-09-11 06:00
2019-08-21 06:00
Limit Profile

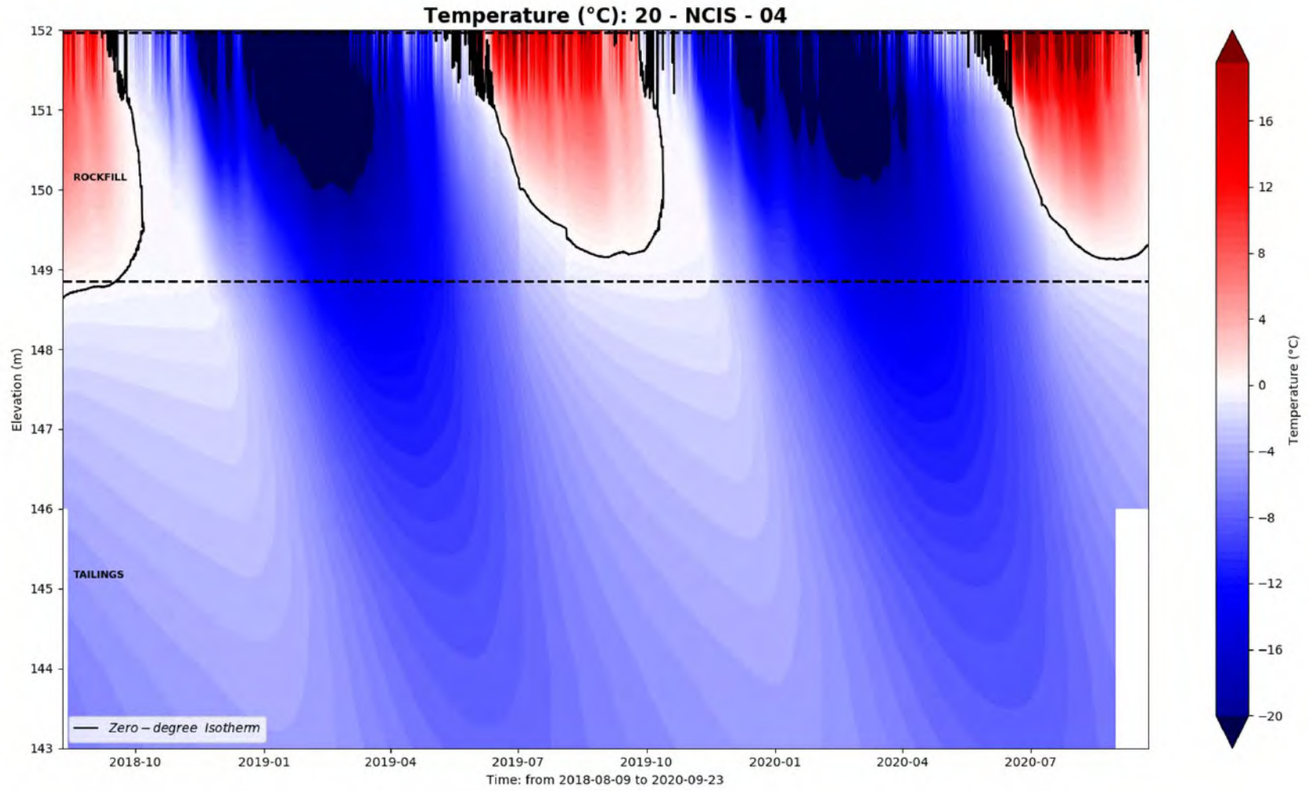

Temperature (°C): 20 - NCIS - 03
ROCKFILL
TAILINGS
Zero – degree Isotherm
Elevation (m)
Temperature (°C)
Time: from 2018-08-10 to 2020-09-23

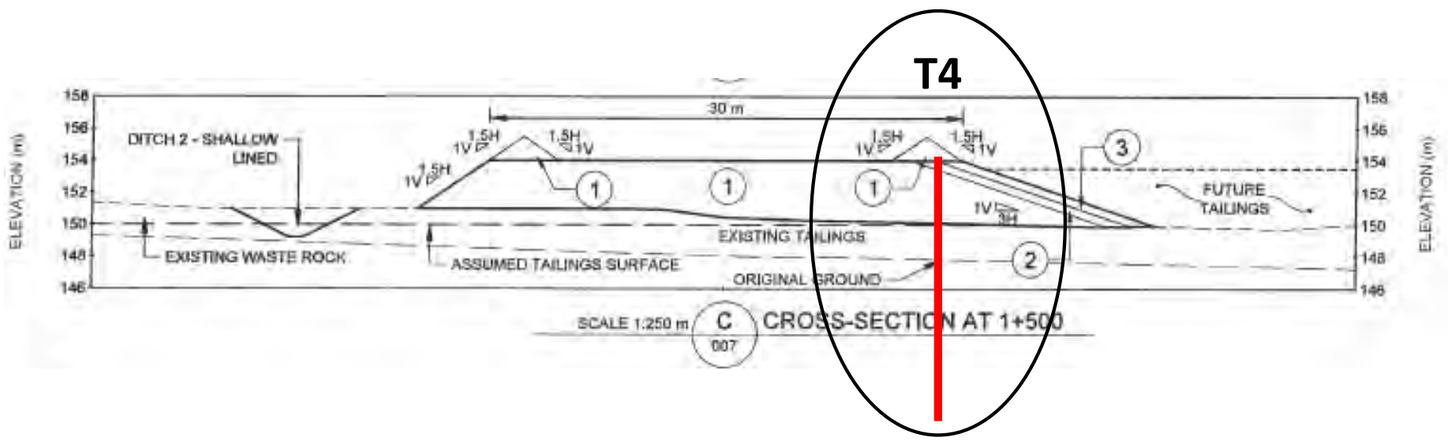

T3
30 m
DITCH 3 - SHALLOW UNLINED
1.5H 1V
1V 3H
FUTURE TAILINGS
EXISTING WASTE ROCK
EXISTING TAILINGS
ORIGINAL GROUND
ASSUMED TAILINGS SURFACE
SCALE 1:250 m
D
008
CROSS-SECTION AT 2+250
ELEVATION (m)

NCIS T4


NCIS T3
NCIS T2
NCIS T1
NCIS T4

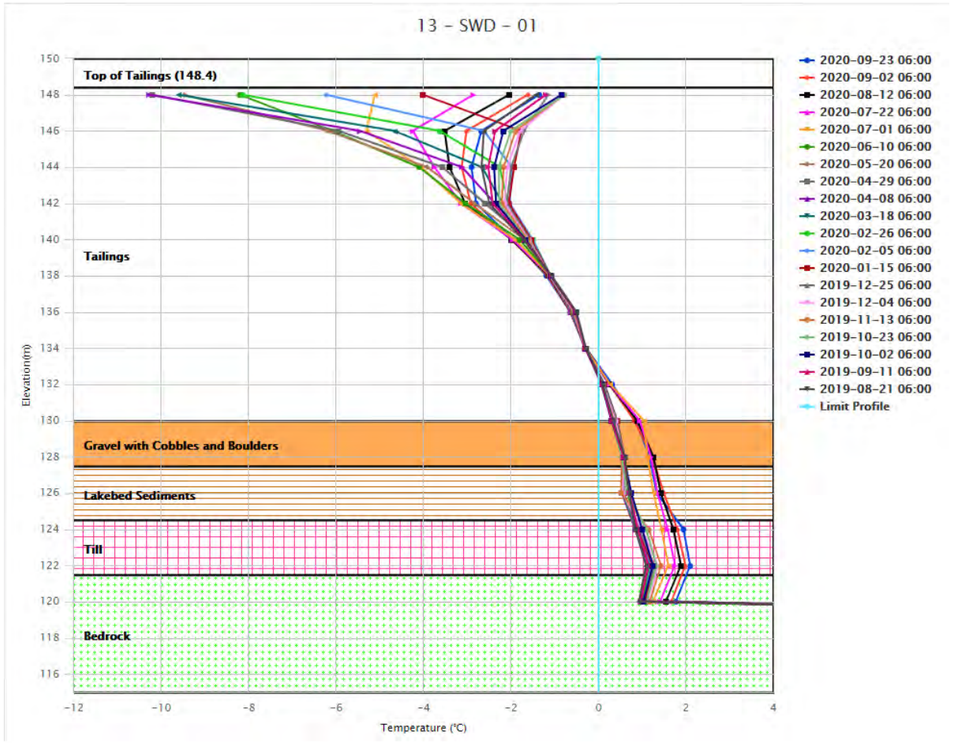

20 - NCIS - 04
Rockfill
Tailing
Elevation(m)
Temperature (°C)
2020-09-23 06:00
2020-09-02 06:00
2020-08-12 06:00
2020-07-22 06:00
2020-07-01 06:00
2020-06-10 06:00
2020-05-20 06:00
2020-04-29 06:00
2020-04-08 06:00
2020-03-18 06:00
2020-02-26 06:00
2020-02-05 06:00
2020-01-15 06:00
2019-12-25 06:00
2019-12-04 06:00
2019-11-13 06:00
2019-10-23 06:00
2019-10-02 06:00
2019-09-11 06:00
2019-08-21 06:00
Limit Profile

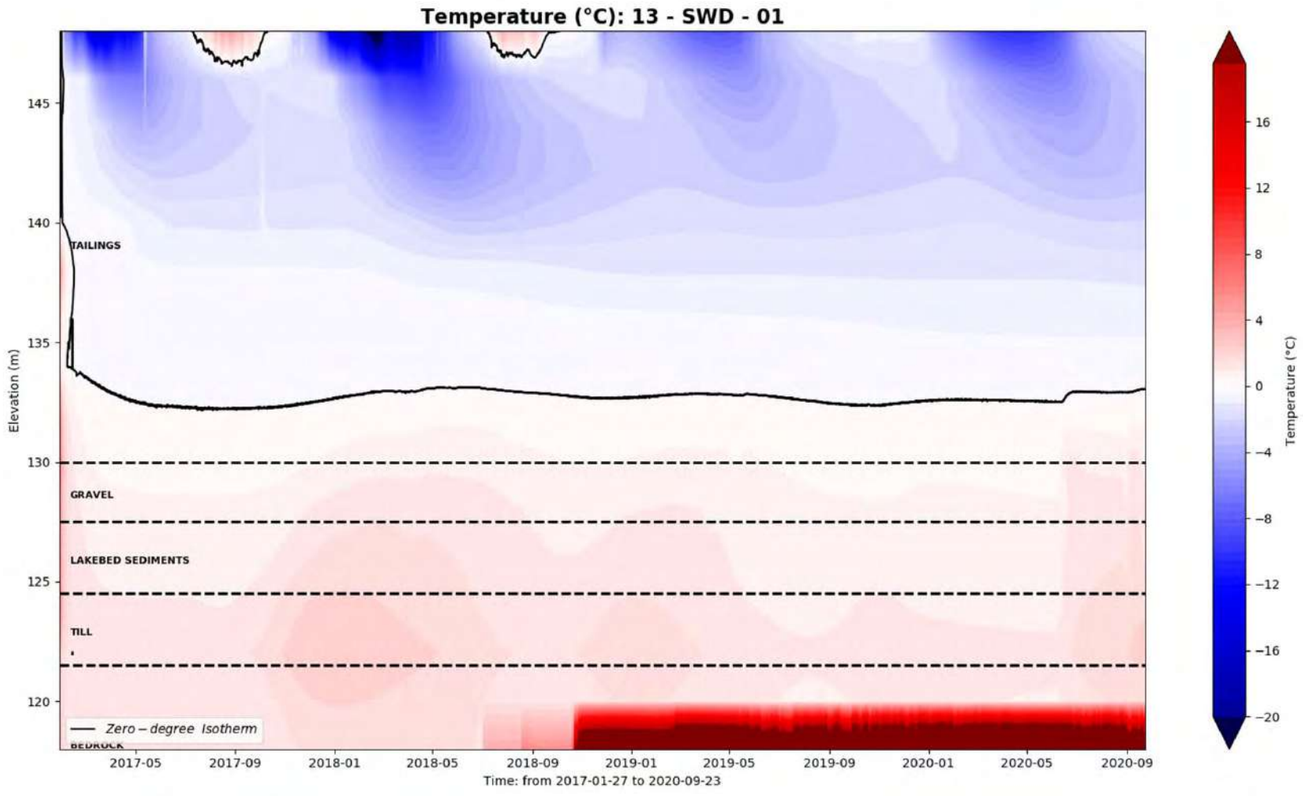

Temperature (°C): 20 - NCIS - 04
ROCKFILL
TAILINGS
Zero – degree Isotherm
Elevation (m)
Temperature (°C)
Time: from 2018-08-09 to 2020-09-23


T4
30 m
DITCH 2 - SHALLOW LINED
EXISTING WASTE ROCK
ASSUMED TAILINGS SURFACE
EXISTING TAILINGS
ORIGINAL GROUND
FUTURE TAILINGS
SCALE 1:250 m
C
007
CROSS-SECTION AT 1+500
ELEVATION (m)

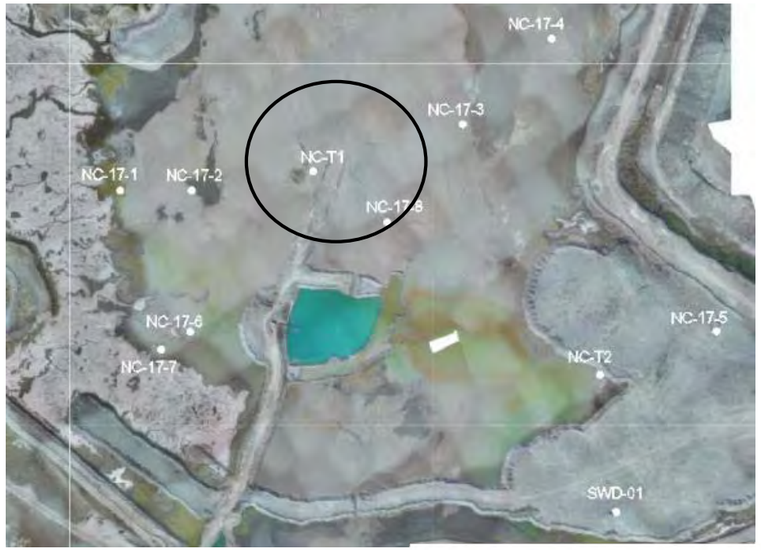
SWD 01

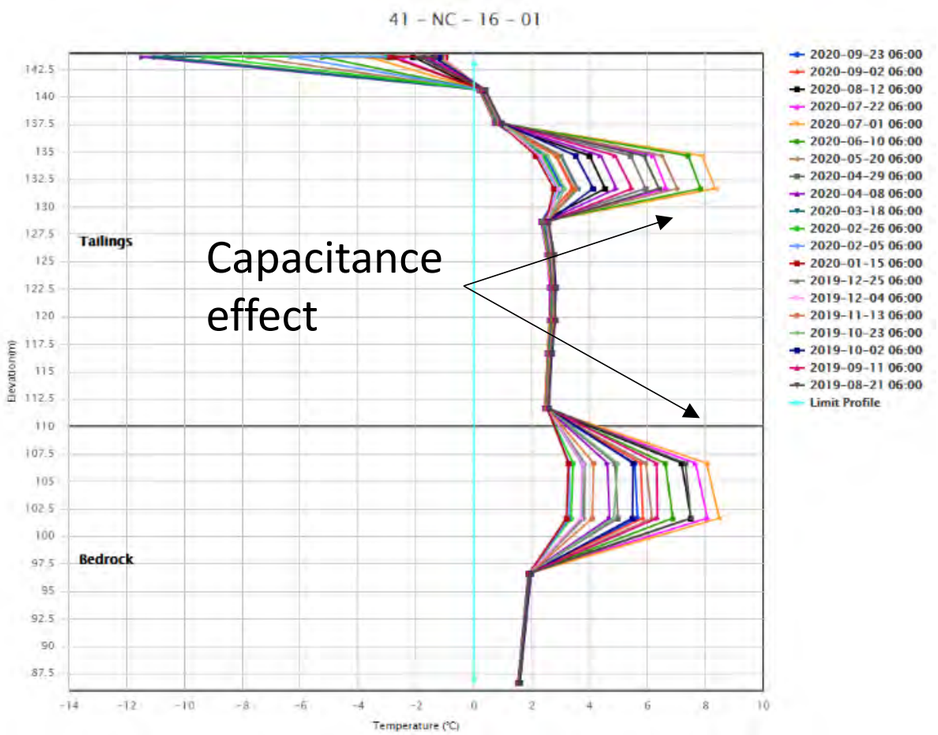

SWD-01
SWD-03

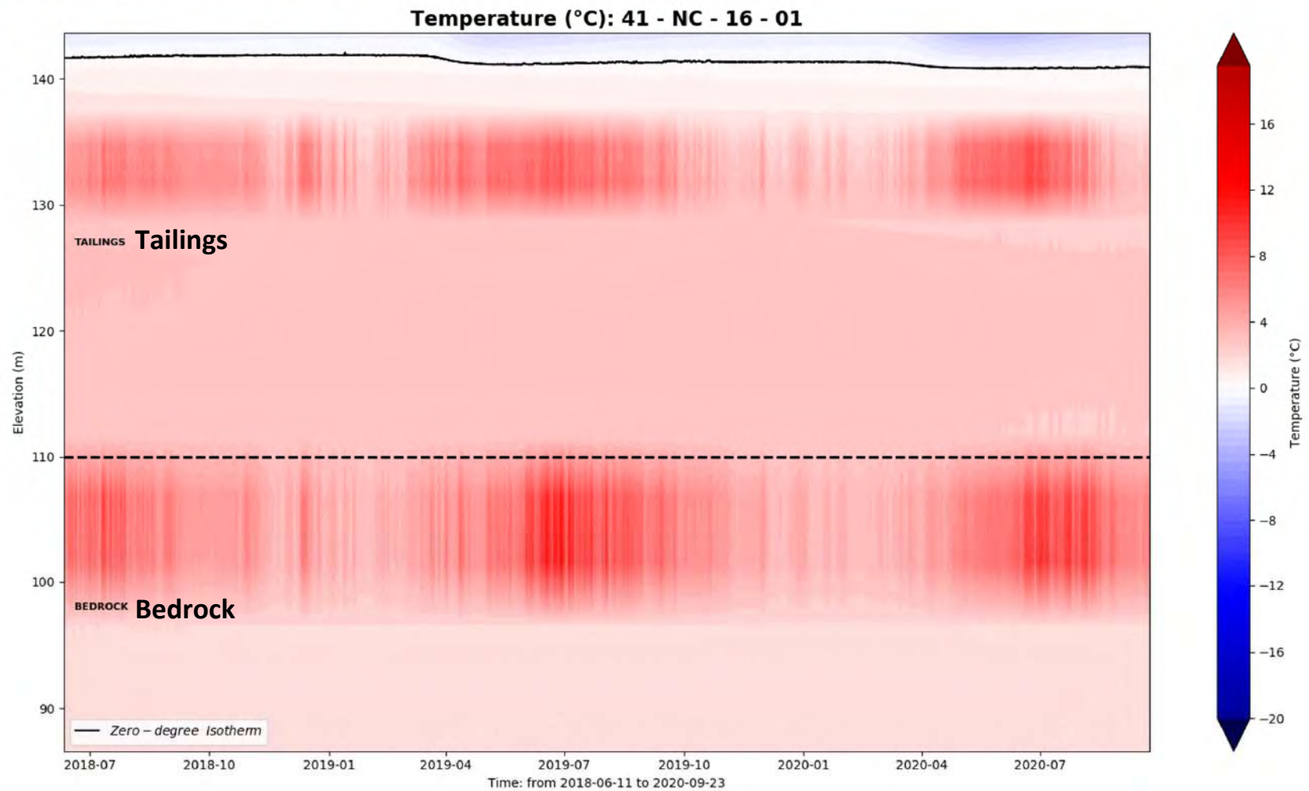

13 - SWD - 01
Top of Tailings (148.4)
Tailings
Gravel with Cobbles and Boulders
Lakebed Sediments
Till
Bedrock
Elevation(m)
Temperature (°C)
2020-09-23 06:00
2020-09-02 06:00
2020-08-12 06:00
2020-07-22 06:00
2020-07-01 06:00
2020-06-10 06:00
2020-05-20 06:00
2020-04-29 06:00
2020-04-08 06:00
2020-03-18 06:00
2020-02-26 06:00
2020-02-05 06:00
2020-01-15 06:00
2019-12-25 06:00
2019-12-04 06:00
2019-11-13 06:00
2019-10-23 06:00
2019-10-02 06:00
2019-09-11 06:00
2019-08-21 06:00
Limit Profile


Temperature (°C): 13 - SWD - 01
TAILINGS
GRAVEL
LAKEBED SEDIMENTS
TILL
BEDROCK
Zero – degree Isotherm
Elevation (m)
Temperature (°C)
Time: from 2017-01-27 to 2020-09-23

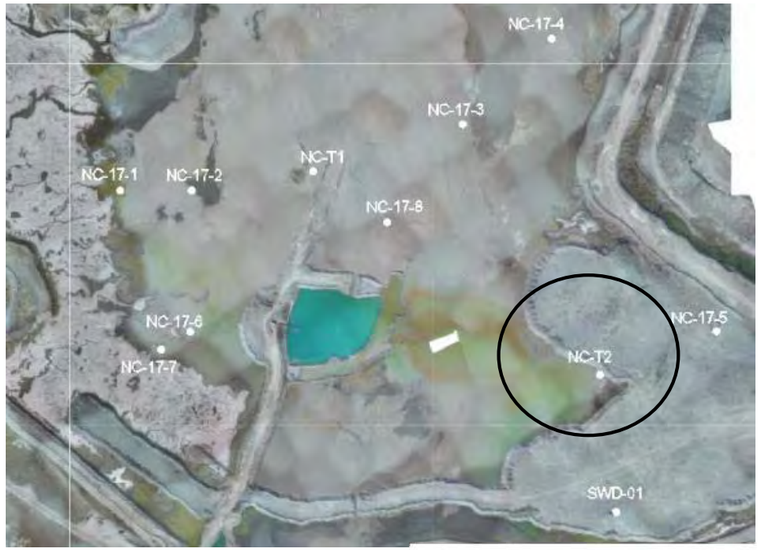
NC-T1

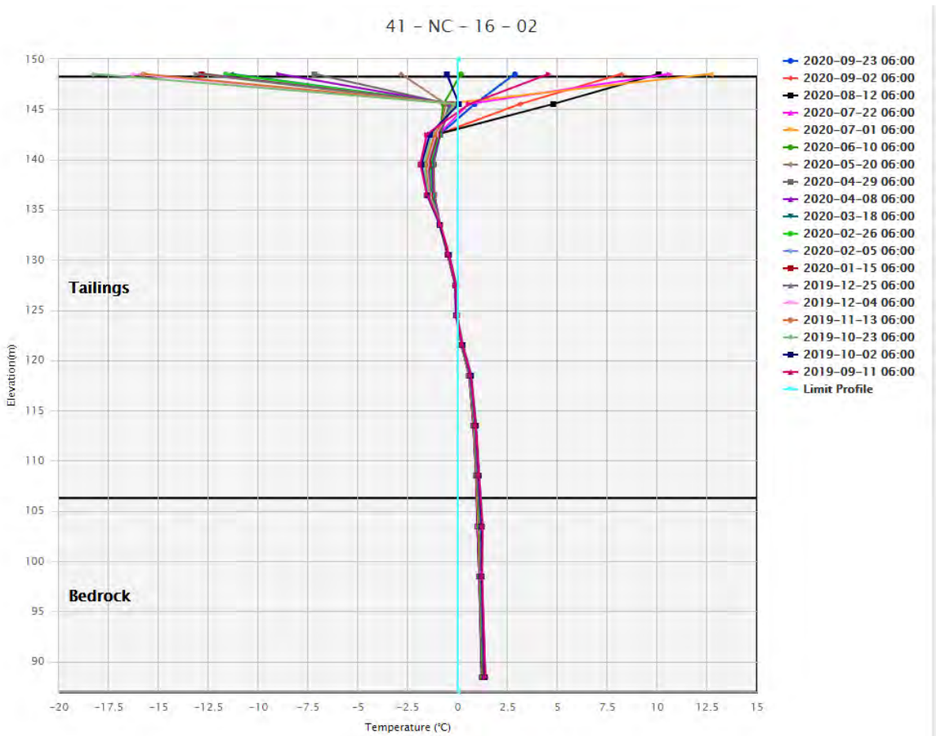

NC-17-4
NC-17-3
NC-T1
NC-17-1
NC-17-2
NC-17-8
NC-17-6
NC-17-7
NC-17-5
NC-T2
SWD-01

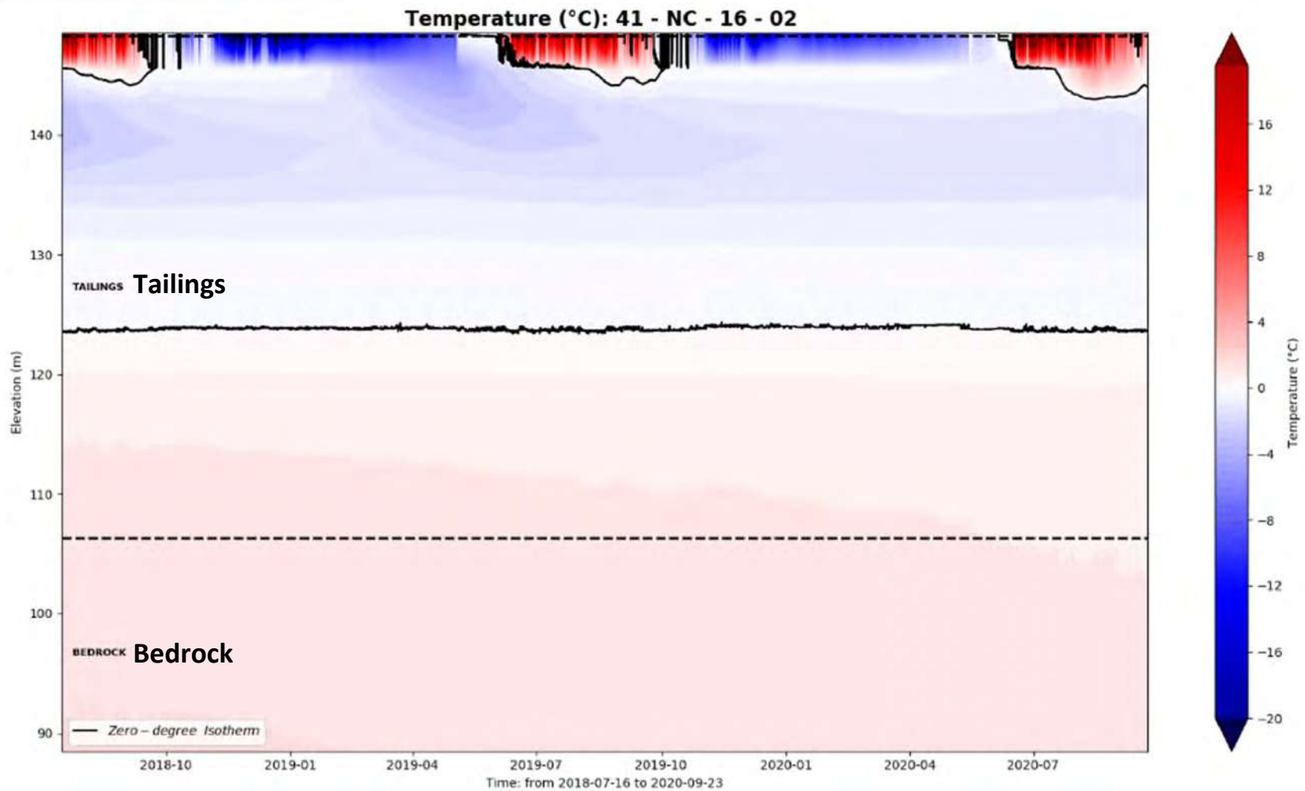

41 – NC – 16 – 01
Tailings
Bedrock
Capacitance effect
Elevation(m)
Temperature (°C)
2020-09-23 06:00
2020-09-02 06:00
2020-08-12 06:00
2020-07-22 06:00
2020-07-01 06:00
2020-06-10 06:00
2020-05-20 06:00
2020-04-29 06:00
2020-04-08 06:00
2020-03-18 06:00
2020-02-26 06:00
2020-02-05 06:00
2020-01-15 06:00
2019-12-25 06:00
2019-12-04 06:00
2019-11-13 06:00
2019-10-23 06:00
2019-10-02 06:00
2019-09-11 06:00
2019-08-21 06:00
Limit Profile


Temperature (°C): 41 - NC - 16 - 01
TAILINGS Tailings
BEDROCK Bedrock
Zero – degree isotherm
Elevation (m)
Temperature (°C)
Time: from 2018-06-11 to 2020-09-23

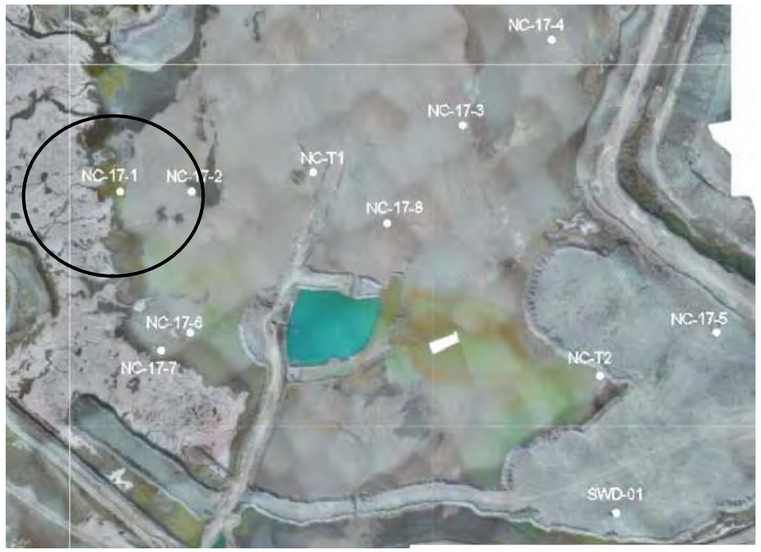
NC-T2

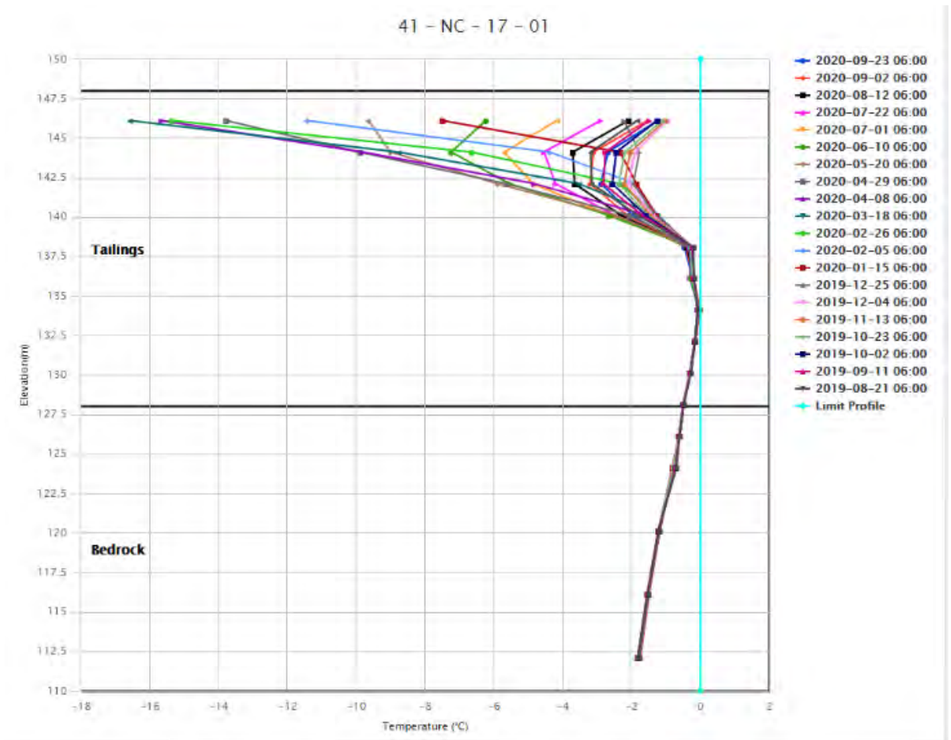

NC-17-4
NC-17-3
NC-T1
NC-17-1
NC-17-2
NC-17-8
NC-17-6
NC-17-7
NC-17-5
NC-T2
SWD-01

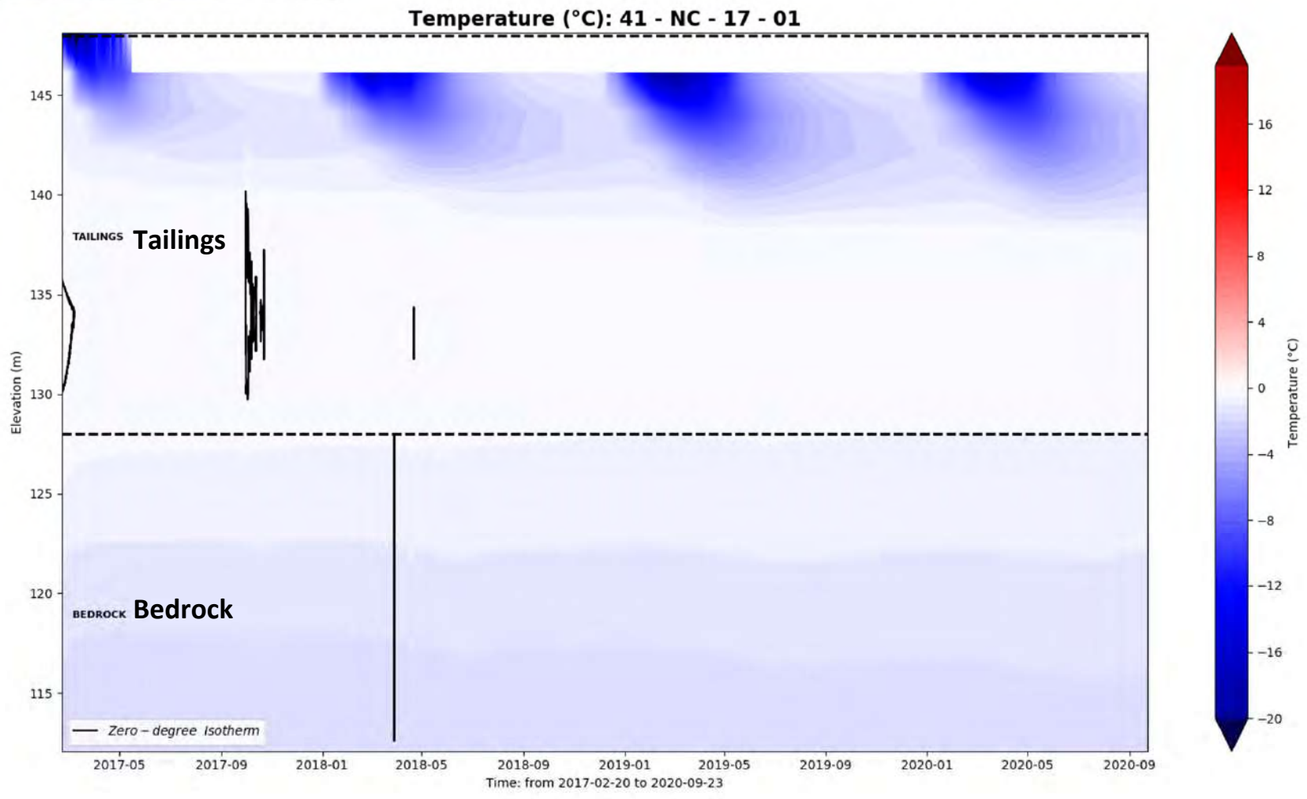

41 – NC – 16 – 02
2020-09-23 06:00
2020-09-02 06:00
2020-08-12 06:00
2020-07-22 06:00
2020-07-01 06:00
2020-06-10 06:00
2020-05-20 06:00
2020-04-29 06:00
2020-04-08 06:00
2020-03-18 06:00
2020-02-26 06:00
2020-02-05 06:00
2020-01-15 06:00
2019-12-25 06:00
2019-12-04 06:00
2019-11-13 06:00
2019-10-23 06:00
2019-10-02 06:00
2019-09-11 06:00
Limit Profile
Tailings
Bedrock
Elevation(m)
Temperature (°C)


Temperature (°C): 41 - NC - 16 - 02
TAILINGS Tailings
BEDROCK Bedrock
Zero – degree Isotherm
Elevation (m)
Temperature (°C)
Time: from 2018-07-16 to 2020-09-23

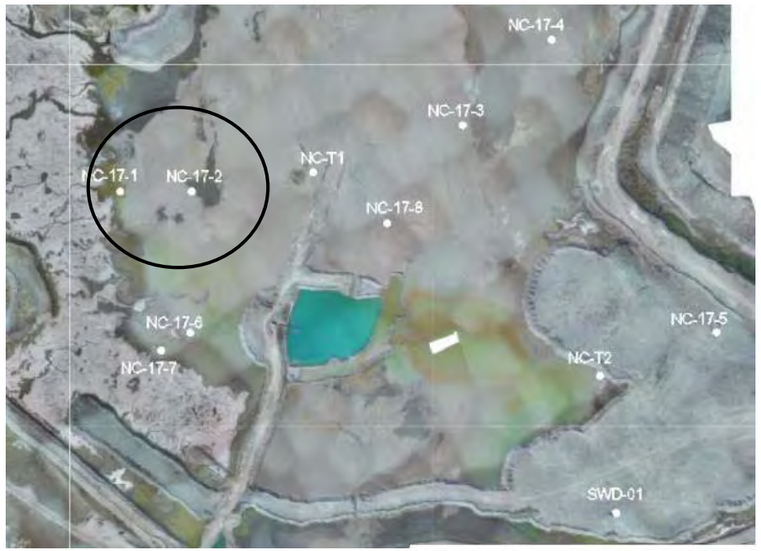
NC-17-1

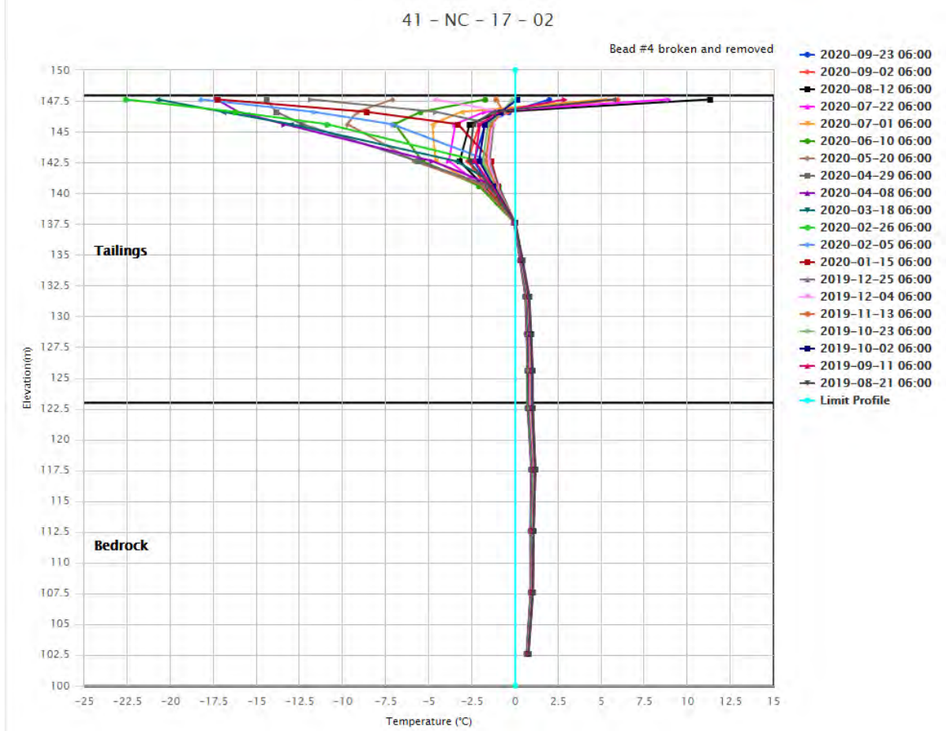

NC-17-4
NC-17-3
NC-T1
NC-17-1
NC-17-2
NC-17-8
NC-17-6
NC-17-7
NC-17-5
NC-T2
SWD-01

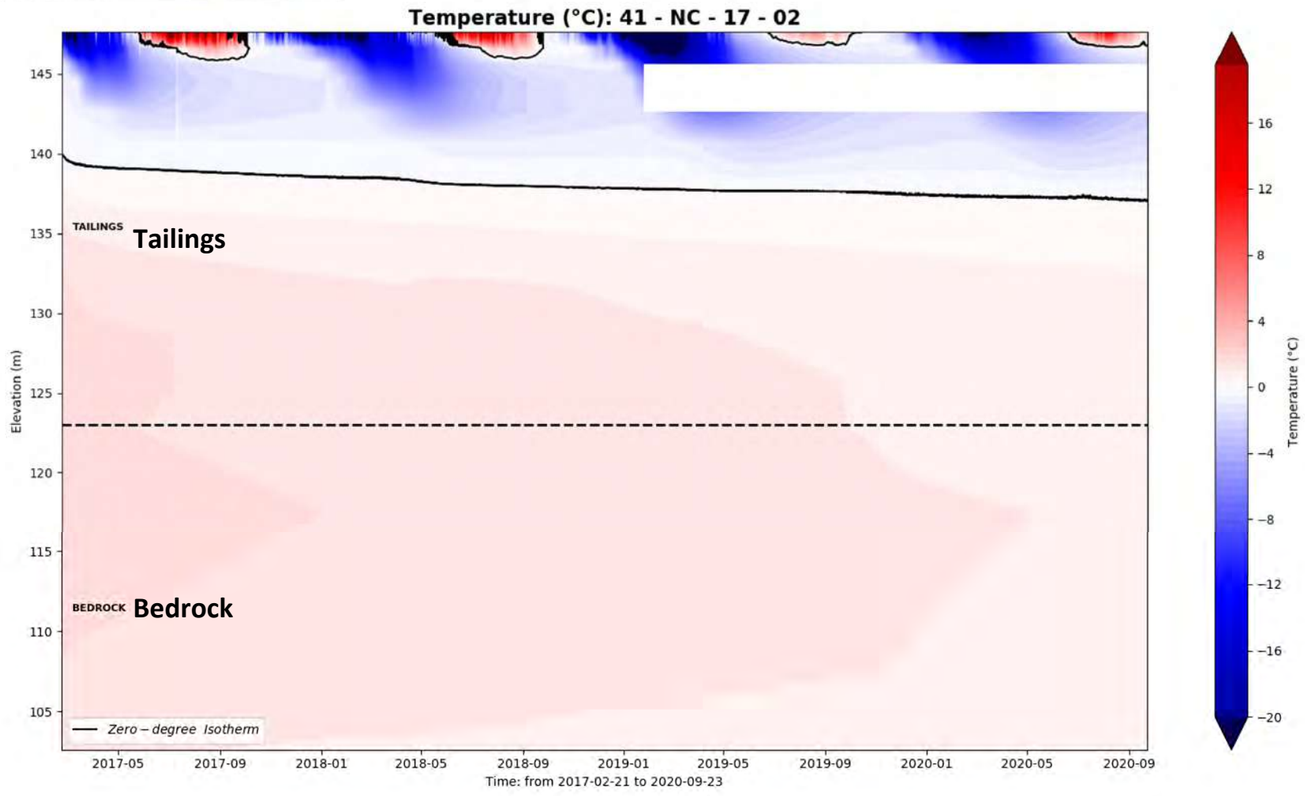

41 - NC - 17 - 01
Tailings
Bedrock
Elevation(m)
Temperature (°C)
2020-09-23 06:00
2020-09-02 06:00
2020-08-12 06:00
2020-07-22 06:00
2020-07-01 06:00
2020-06-10 06:00
2020-05-20 06:00
2020-04-29 06:00
2020-04-08 06:00
2020-03-18 06:00
2020-02-26 06:00
2020-02-05 06:00
2020-01-15 06:00
2019-12-25 06:00
2019-12-04 06:00
2019-11-13 06:00
2019-10-23 06:00
2019-10-02 06:00
2019-09-11 06:00
2019-08-21 06:00
Limit Profile


Temperature (°C): 41 - NC - 17 - 01
TAILINGS Tailings
BEDROCK Bedrock
Zero – degree Isotherm
Elevation (m)
Time: from 2017-02-20 to 2020-09-23
Temperature (°C)

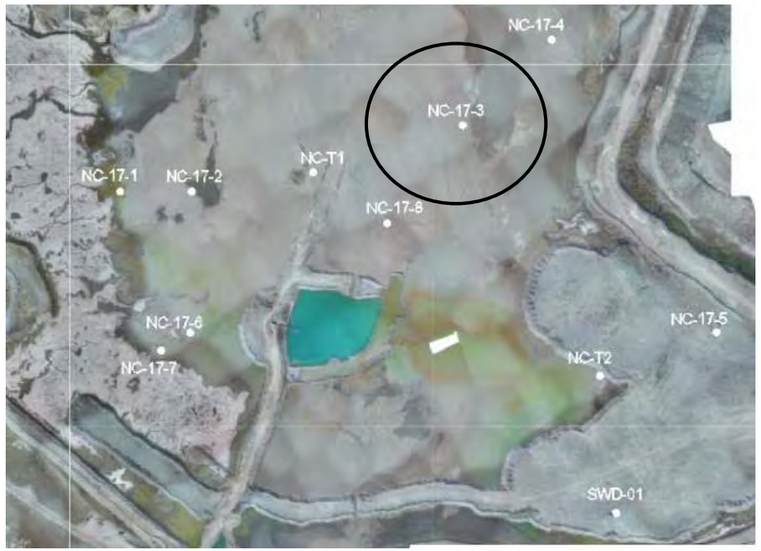
NC-17-2

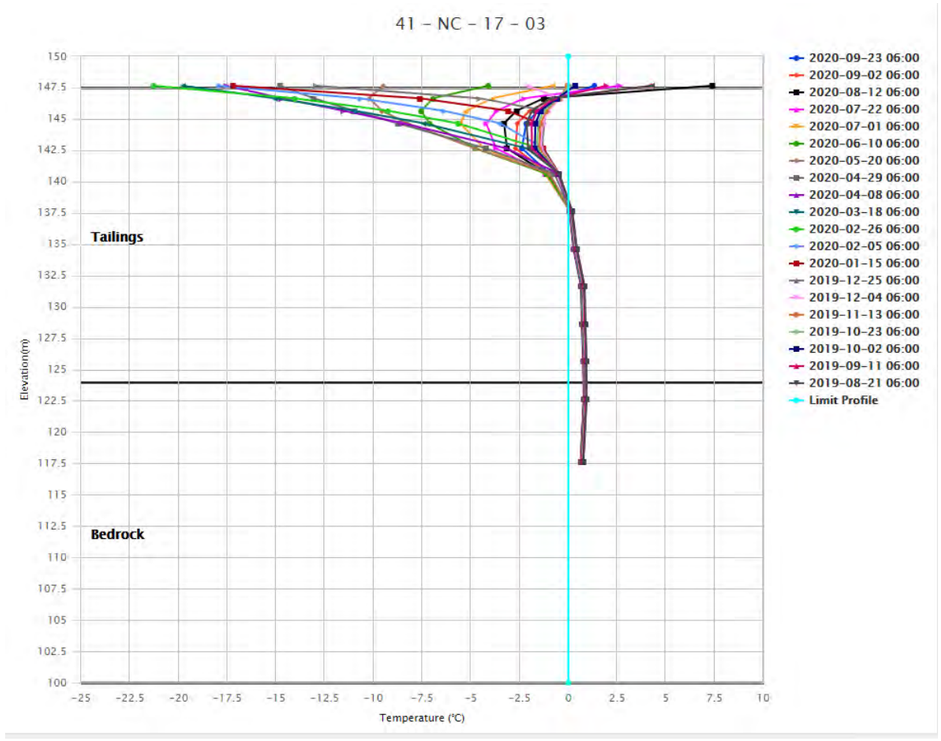

NC-17-4
NC-17-3
NC-T1
NC-17-1
NC-17-2
NC-17-8
NC-17-6
NC-17-7
NC-17-5
NC-T2
SWD-01

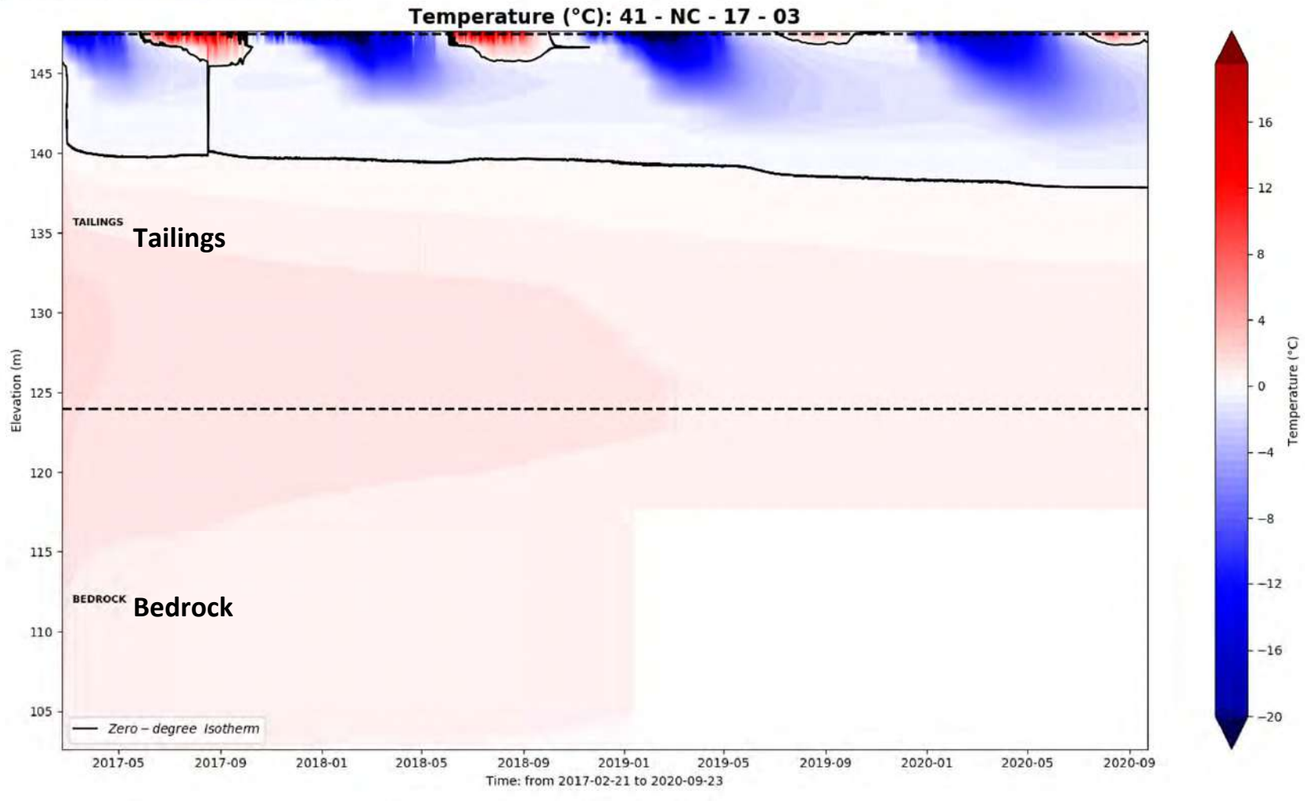

41 – NC – 17 – 02
Bead #4 broken and removed
2020-09-23 06:00
2020-09-02 06:00
2020-08-12 06:00
2020-07-22 06:00
2020-07-01 06:00
2020-06-10 06:00
2020-05-20 06:00
2020-04-29 06:00
2020-04-08 06:00
2020-03-18 06:00
2020-02-26 06:00
2020-02-05 06:00
2020-01-15 06:00
2019-12-25 06:00
2019-12-04 06:00
2019-11-13 06:00
2019-10-23 06:00
2019-10-02 06:00
2019-09-11 06:00
2019-08-21 06:00
Limit Profile
Tailings
Bedrock
Elevation(m)
Temperature (°C)


Temperature (°C): 41 - NC - 17 - 02
TAILINGS
Tailings
BEDROCK
Bedrock
Zero – degree Isotherm
Elevation (m)
Time: from 2017-02-21 to 2020-09-23
Temperature (°C)

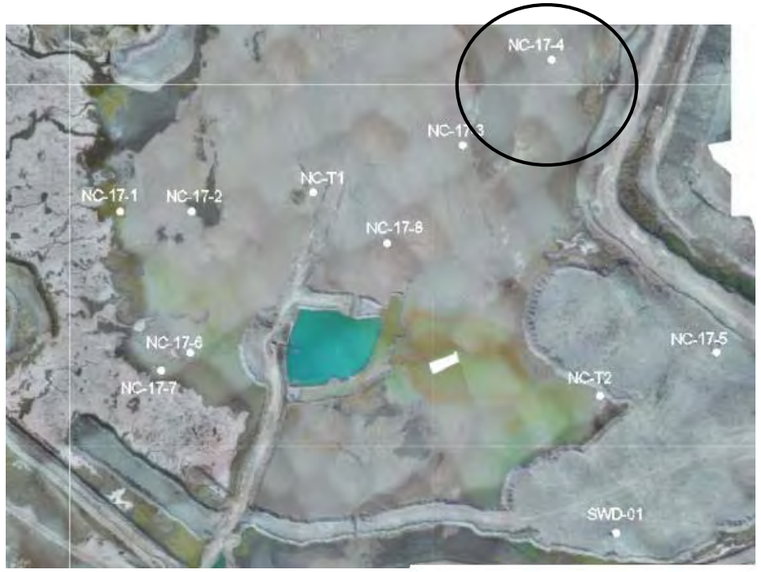
NC-17-3

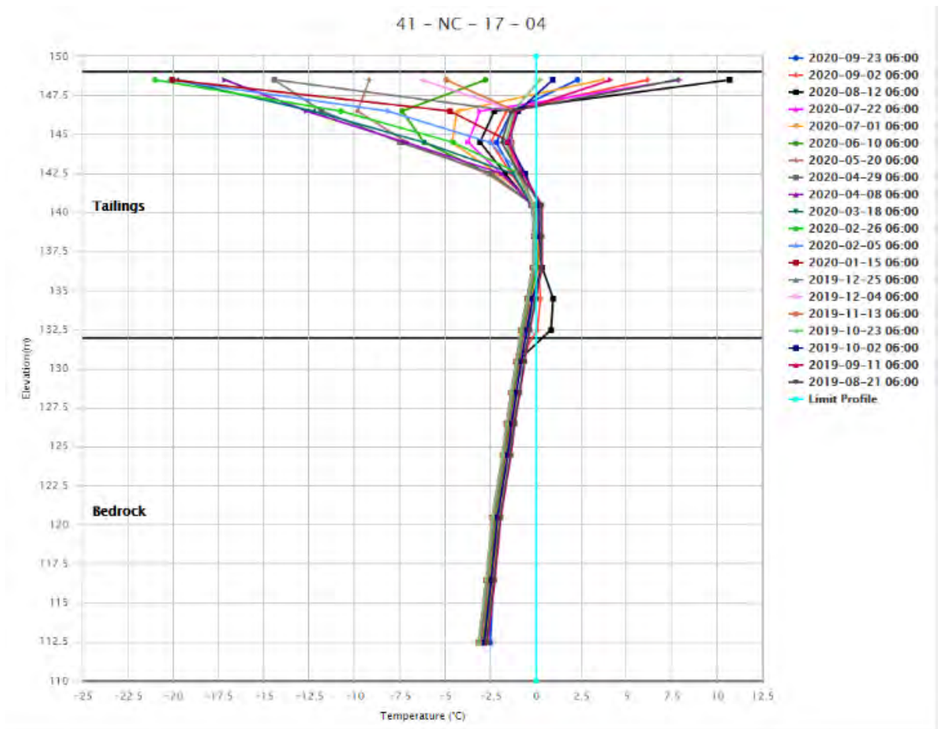

NC-17-4
NC-17-3
NC-T1
NC-17-1
NC-17-2
NC-17-8
NC-17-6
NC-17-7
NC-17-5
NC-T2
SWD-01

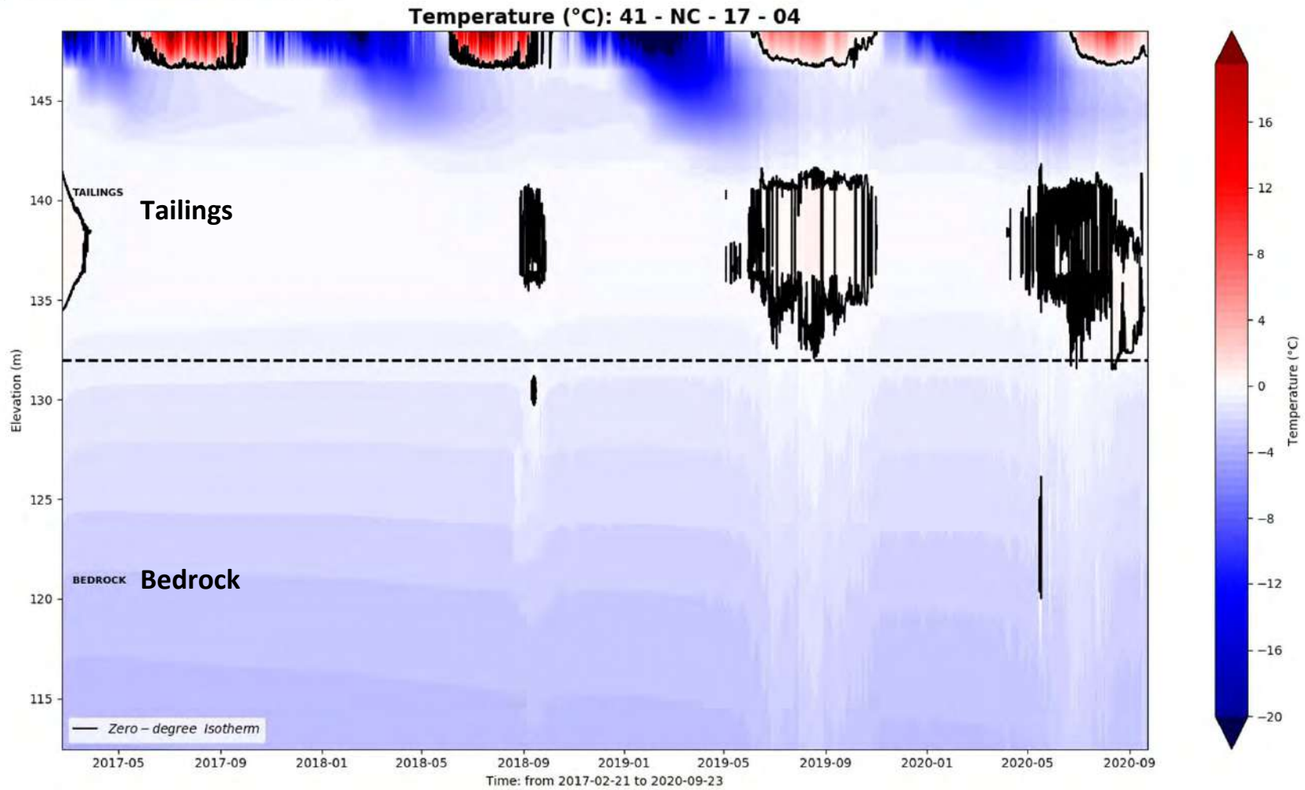

41 – NC – 17 – 03
2020-09-23 06:00
2020-09-02 06:00
2020-08-12 06:00
2020-07-22 06:00
2020-07-01 06:00
2020-06-10 06:00
2020-05-20 06:00
2020-04-29 06:00
2020-04-08 06:00
2020-03-18 06:00
2020-02-26 06:00
2020-02-05 06:00
2020-01-15 06:00
2019-12-25 06:00
2019-12-04 06:00
2019-11-13 06:00
2019-10-23 06:00
2019-10-02 06:00
2019-09-11 06:00
2019-08-21 06:00
Limit Profile
Tailings
Bedrock
Elevation(m)
Temperature (°C)


Temperature (°C): 41 - NC - 17 - 03
TAILINGS
Tailings
BEDROCK
Bedrock
Zero – degree Isotherm
Elevation (m)
Time: from 2017-02-21 to 2020-09-23
Temperature (°C)

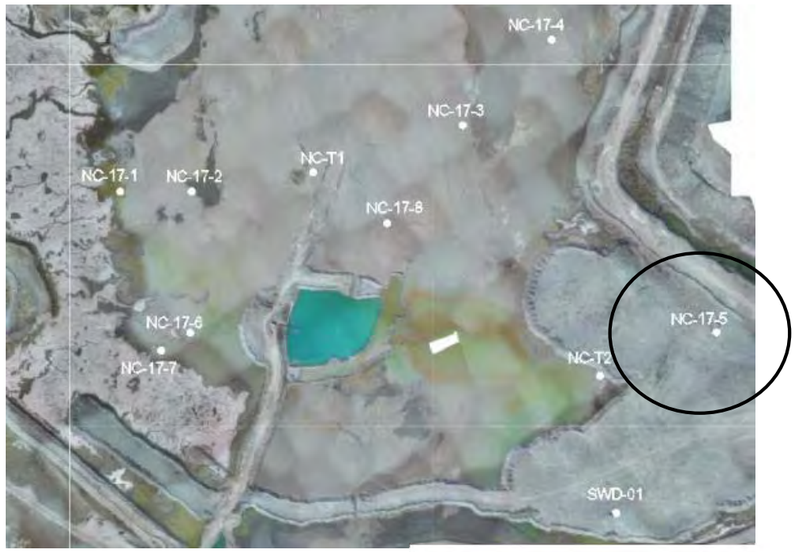
NC-17-4

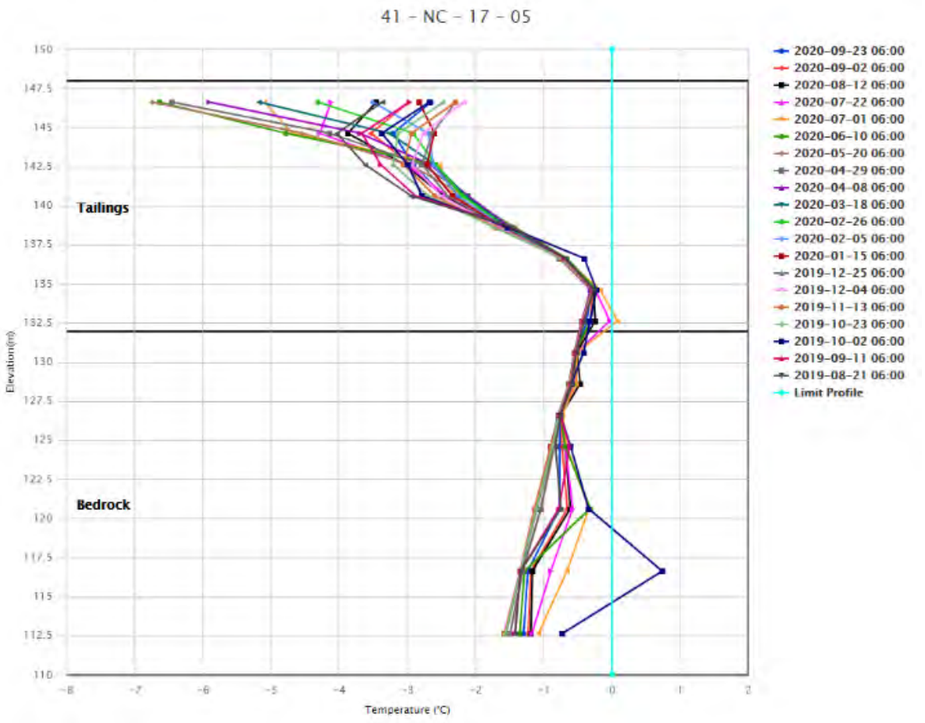

NC-17-4
NC-17-3
NC-T1
NC-17-1
NC-17-2
NC-17-8
NC-17-6
NC-17-7
NC-17-5
NC-T2
SWD-01

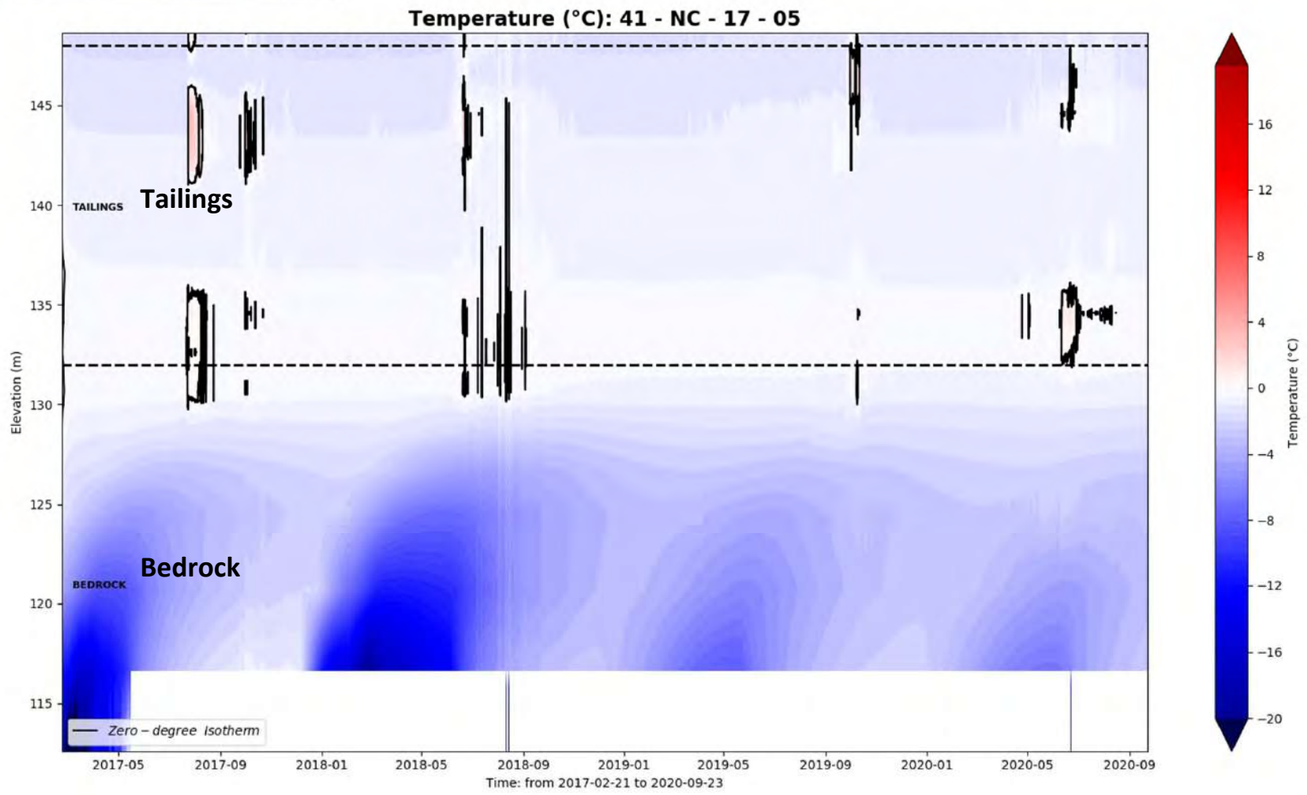

41 – NC – 17 – 04
Tailings
Bedrock
Elevation(m)
Temperature (°C)
2020-09-23 06:00
2020-09-02 06:00
2020-08-12 06:00
2020-07-22 06:00
2020-07-01 06:00
2020-06-10 06:00
2020-05-20 06:00
2020-04-29 06:00
2020-04-08 06:00
2020-03-18 06:00
2020-02-26 06:00
2020-02-05 06:00
2020-01-15 06:00
2019-12-25 06:00
2019-12-04 06:00
2019-11-13 06:00
2019-10-23 06:00
2019-10-02 06:00
2019-09-11 06:00
2019-08-21 06:00
Limit Profile


Temperature (°C): 41 - NC - 17 - 04
Tailings
Bedrock
TAILINGS
BEDROCK
Zero – degree Isotherm
Elevation (m)
Time: from 2017-02-21 to 2020-09-23
Temperature (°C)

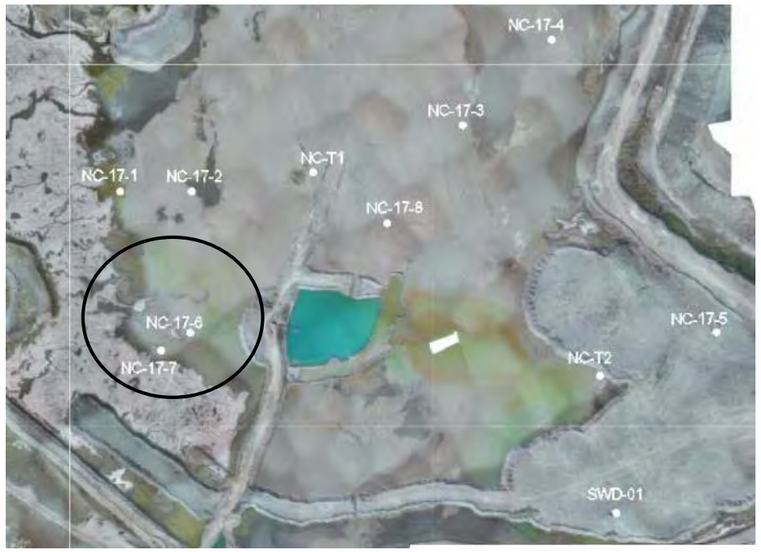
NC-17-5

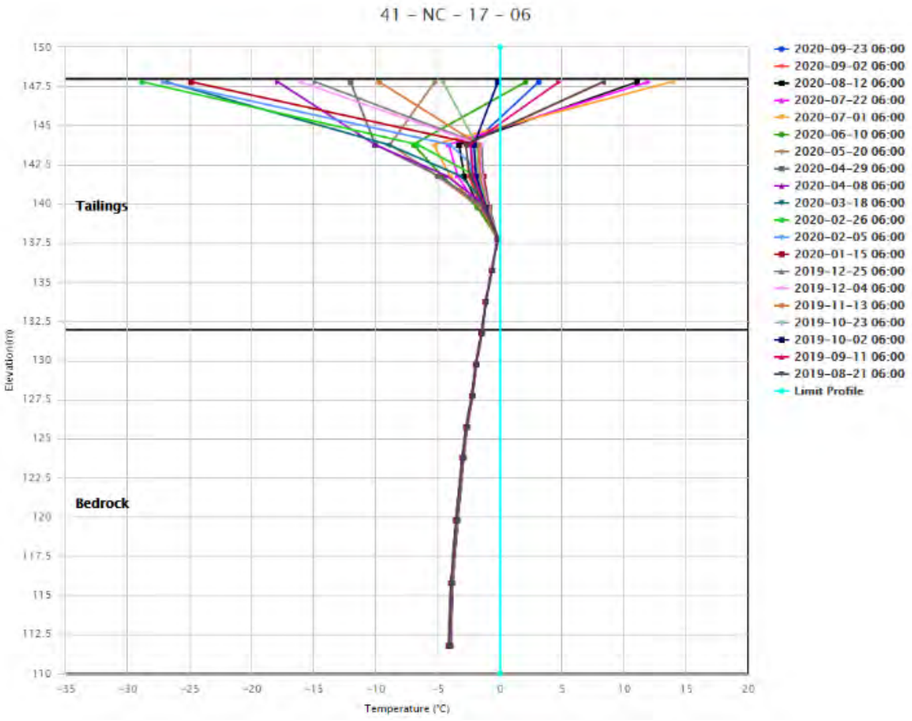

NC-17-4
NC-17-3
NC-T1
NC-17-1
NC-17-2
NC-17-8
NC-17-6
NC-17-7
NC-17-5
NC-T2
SWD-01

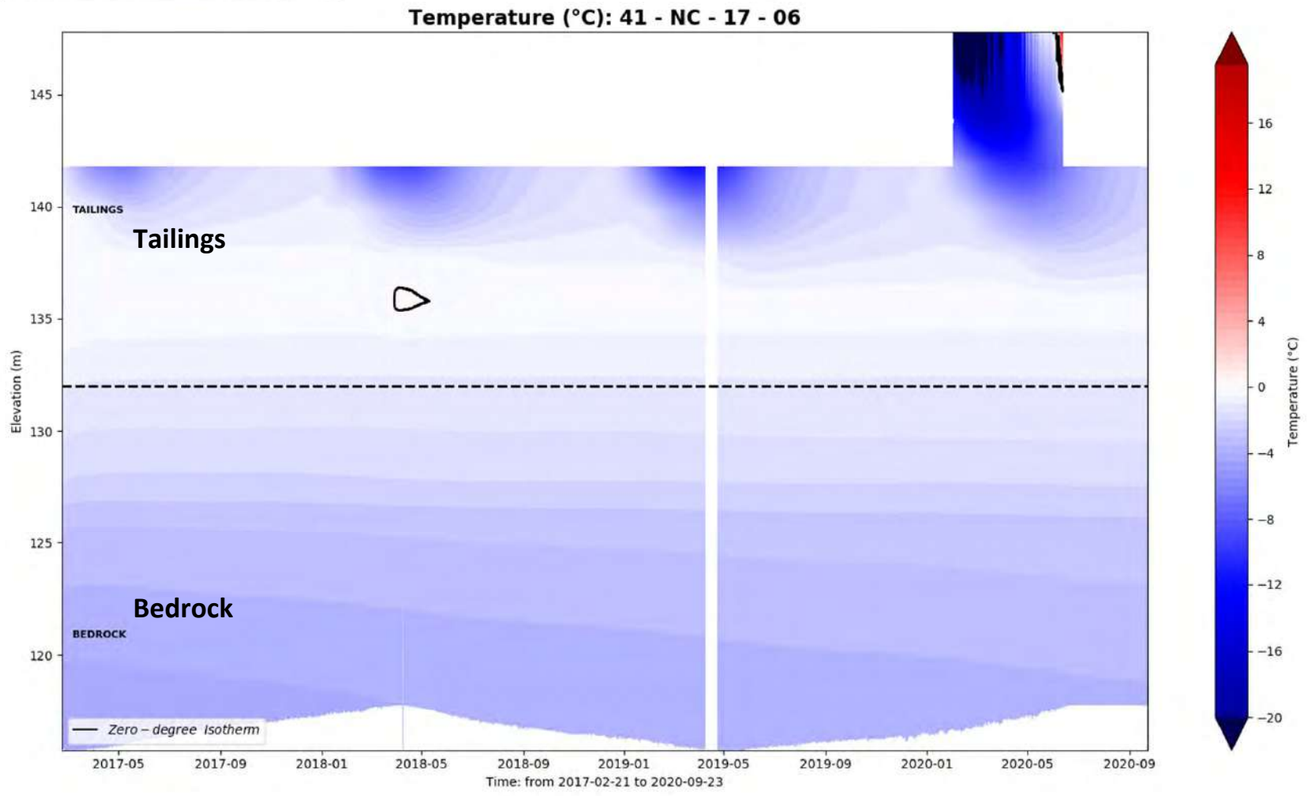

41 - NC - 17 - 05
Tailings
Bedrock
Elevation(m)
Temperature (°C)
2020-09-23 06:00
2020-09-02 06:00
2020-08-12 06:00
2020-07-22 06:00
2020-07-01 06:00
2020-06-10 06:00
2020-05-20 06:00
2020-04-29 06:00
2020-04-08 06:00
2020-03-18 06:00
2020-02-26 06:00
2020-02-05 06:00
2020-01-15 06:00
2019-12-25 06:00
2019-12-04 06:00
2019-11-13 06:00
2019-10-23 06:00
2019-10-02 06:00
2019-09-11 06:00
2019-08-21 06:00
Limit Profile


Temperature (°C): 41 - NC - 17 - 05
Tailings
TAILINGS
Bedrock
BEDROCK
Zero – degree Isotherm
Elevation (m)
Time: from 2017-02-21 to 2020-09-23
Temperature (°C)

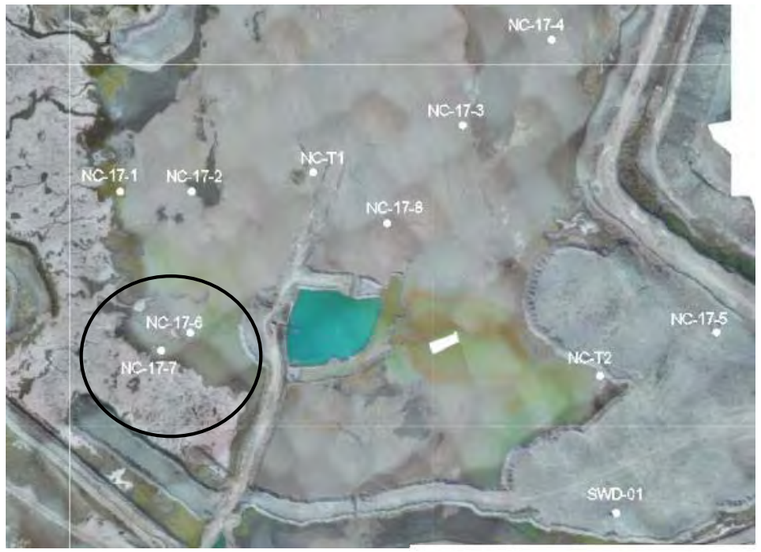
NC-17-6

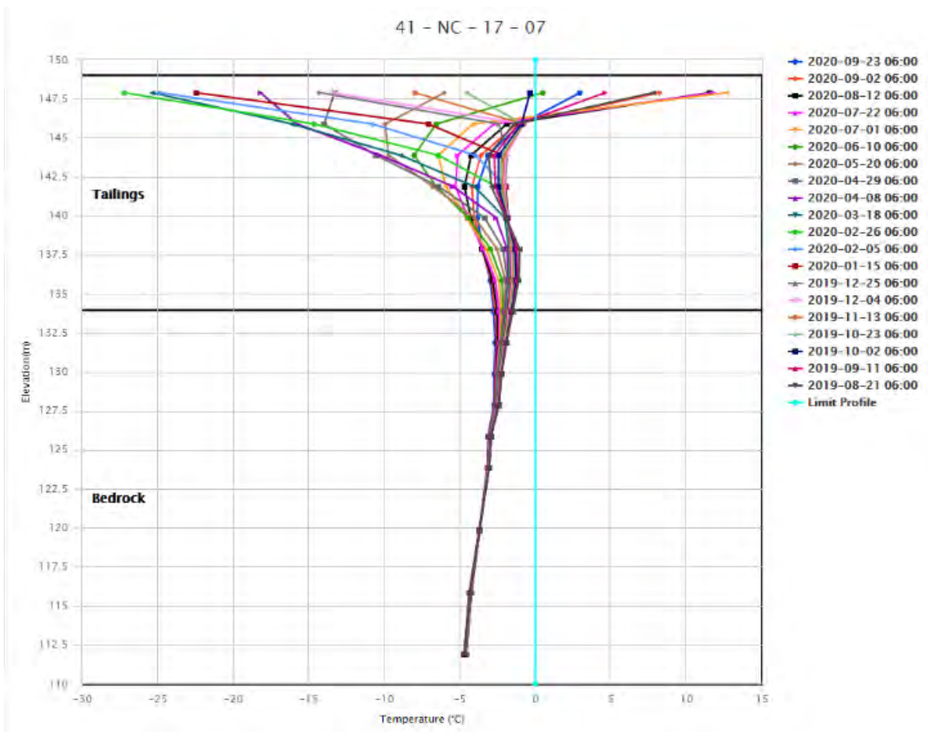

NC-17-4
NC-17-3
NC-T1
NC-17-1
NC-17-2
NC-17-8
NC-17-6
NC-17-7
NC-17-5
NC-T2
SWD-01

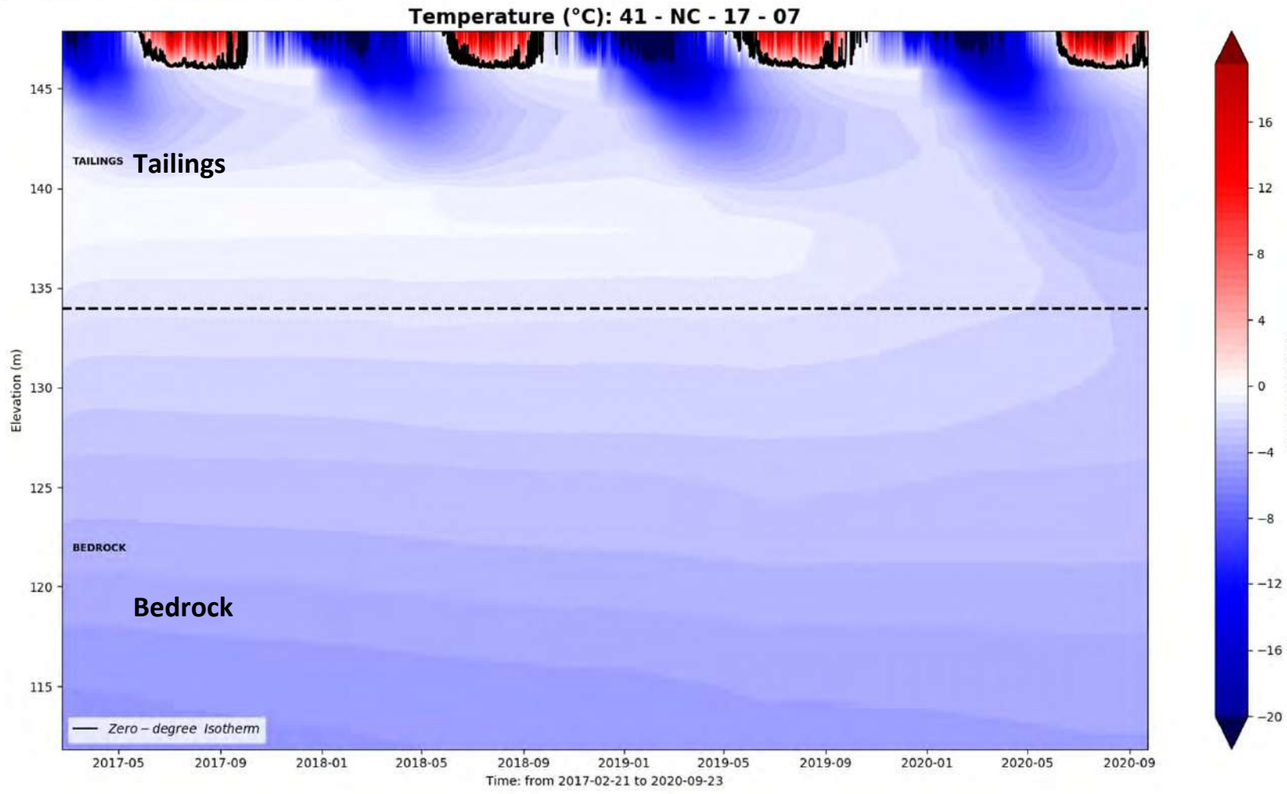

41 - NC - 17 - 06
Tailings
Bedrock
Elevation (m)
Temperature (°C)
2020-09-23 06:00
2020-09-02 06:00
2020-08-12 06:00
2020-07-22 06:00
2020-07-01 06:00
2020-06-10 06:00
2020-05-20 06:00
2020-04-29 06:00
2020-04-08 06:00
2020-03-18 06:00
2020-02-26 06:00
2020-02-05 06:00
2020-01-15 06:00
2019-12-25 06:00
2019-12-04 06:00
2019-11-13 06:00
2019-10-23 06:00
2019-10-02 06:00
2019-09-11 06:00
2019-08-21 06:00
Limit Profile


Temperature (°C): 41 - NC - 17 - 06
TAILINGS
Tailings
BEDROCK
Bedrock
Zero – degree Isotherm
Elevation (m)
Time: from 2017-02-21 to 2020-09-23
Temperature (°C)

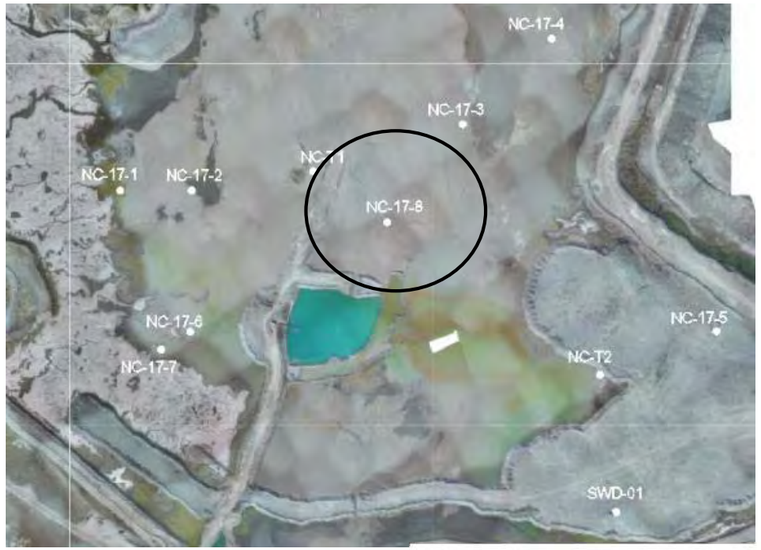
NC-17-7

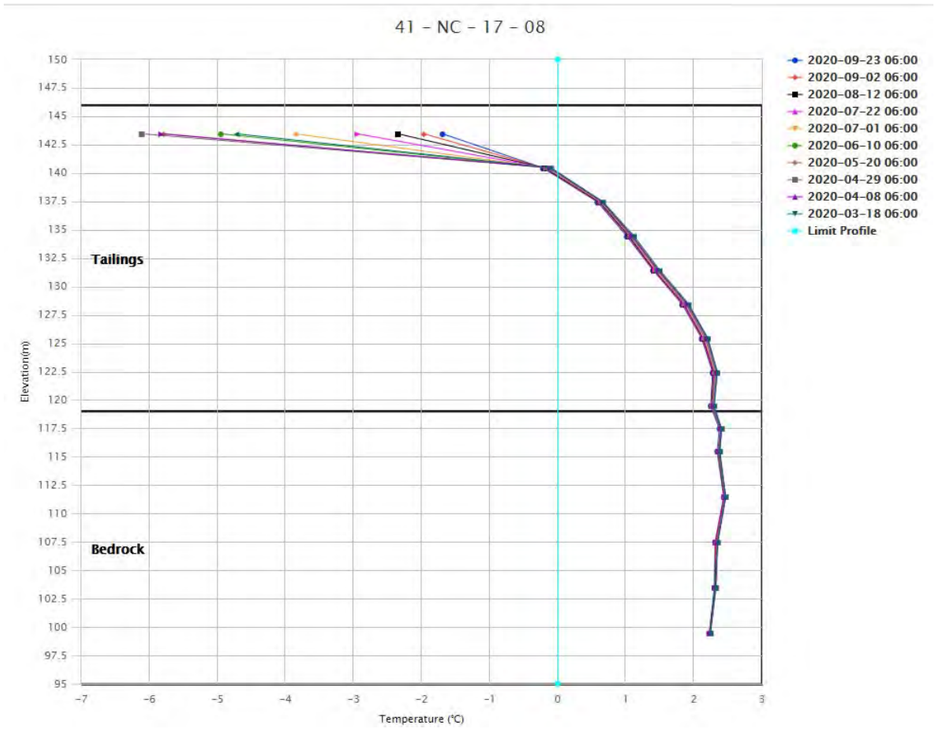

NC-17-4
NC-17-3
NC-T1
NC-17-1
NC-17-2
NC-17-8
NC-17-6
NC-17-7
NC-17-5
NC-T2
SWD-01

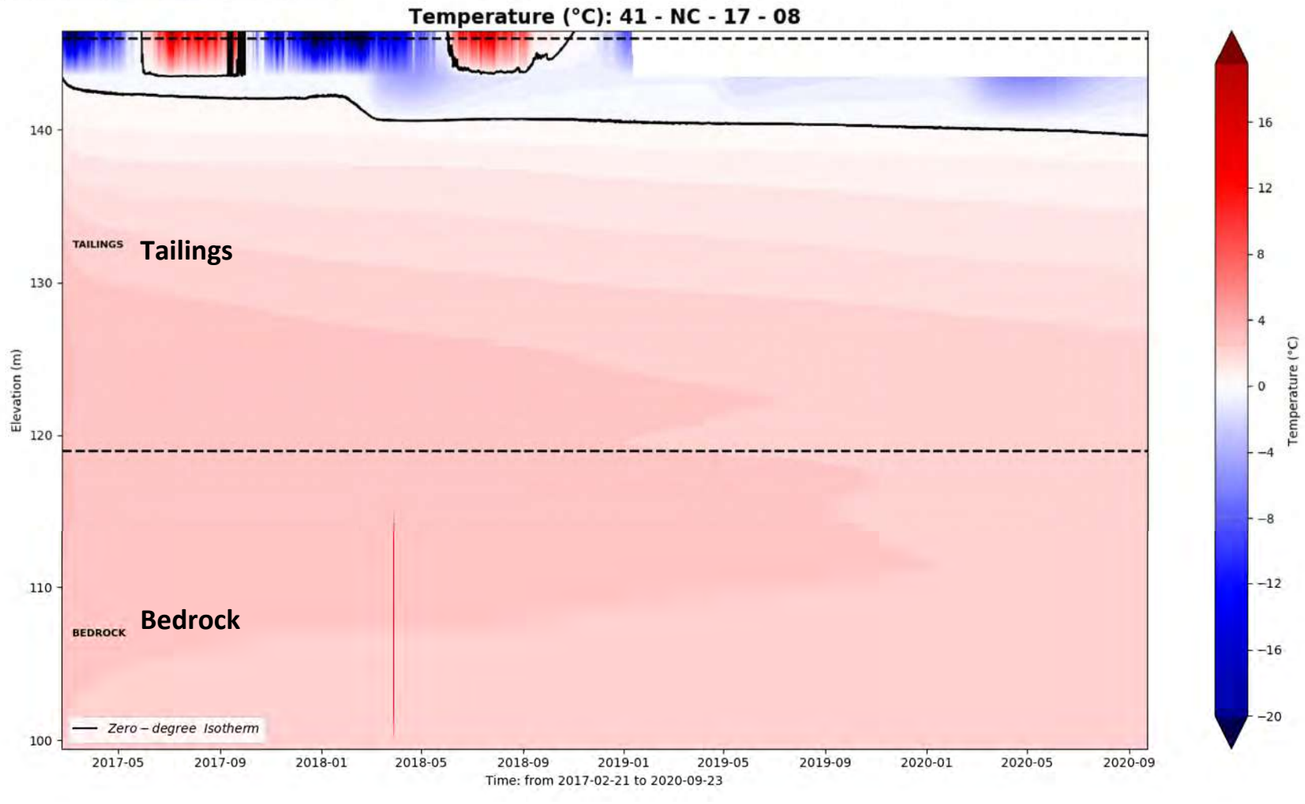

41 – NC – 17 – 07
Tailings
Bedrock
Elevation(m)
Temperature (°C)
2020-09-23 06:00
2020-09-02 06:00
2020-08-12 06:00
2020-07-22 06:00
2020-07-01 06:00
2020-06-10 06:00
2020-05-20 06:00
2020-04-29 06:00
2020-04-08 06:00
2020-03-18 06:00
2020-02-26 06:00
2020-02-05 06:00
2020-01-15 06:00
2019-12-25 06:00
2019-12-04 06:00
2019-11-13 06:00
2019-10-23 06:00
2019-10-02 06:00
2019-09-11 06:00
2019-08-21 06:00
Limit Profile


Temperature (°C): 41 - NC - 17 - 07
TAILINGS Tailings
BEDROCK
Bedrock
Zero – degree Isotherm
Elevation (m)
Time: from 2017-02-21 to 2020-09-23
Temperature (°C)

NC-17-8


NC-17-4
NC-17-3
NC-17-1
NC-17-2
NC-17-8
NC-17-6
NC-17-7
NC-17-5
NC-T2
SWD-01

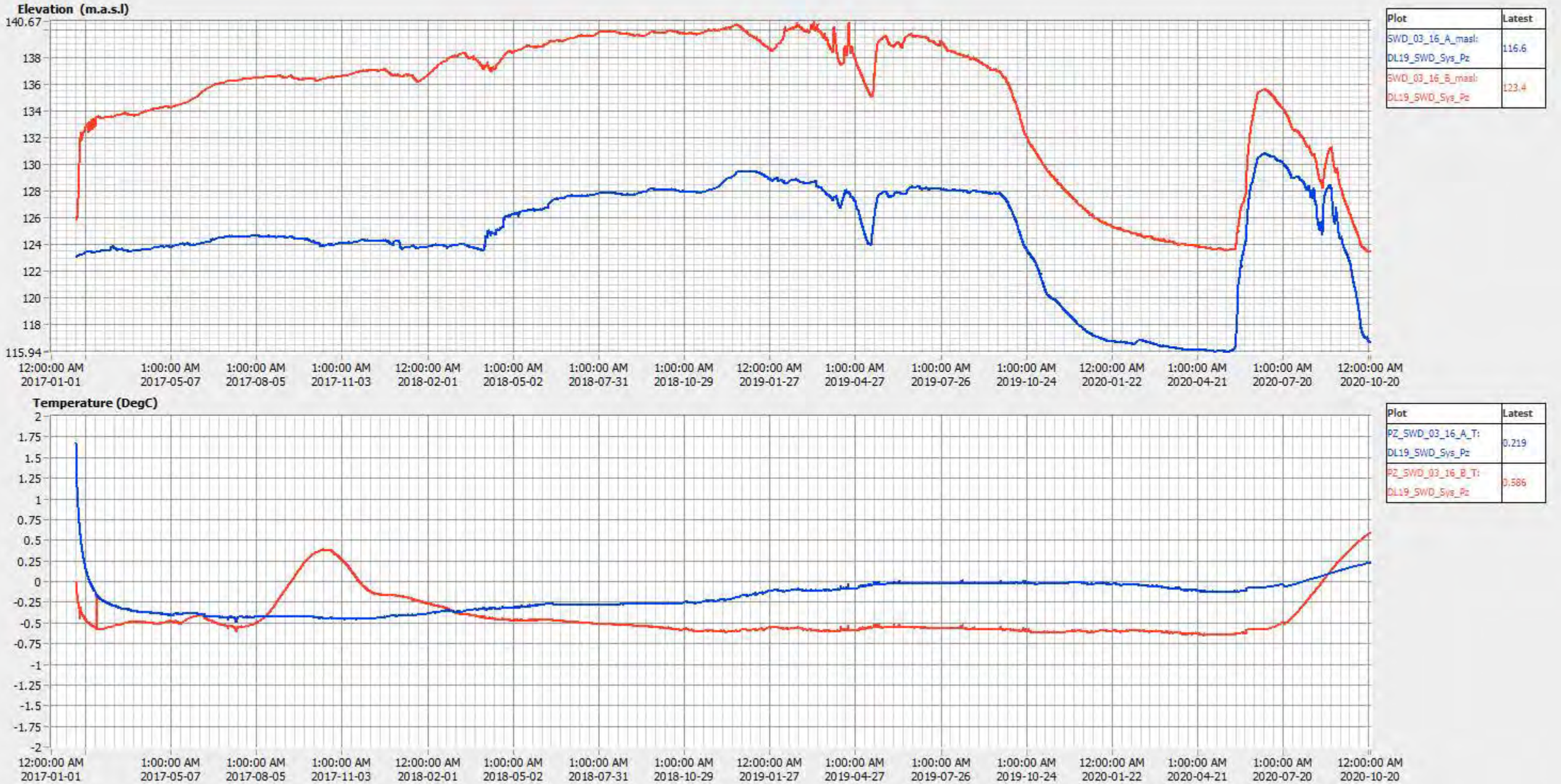

41 – NC – 17 – 08
2020-09-23 06:00
2020-09-02 06:00
2020-08-12 06:00
2020-07-22 06:00
2020-07-01 06:00
2020-06-10 06:00
2020-05-20 06:00
2020-04-29 06:00
2020-04-08 06:00
2020-03-18 06:00
Limit Profile
Tailings
Bedrock
Elevation(m)
Temperature (°C)

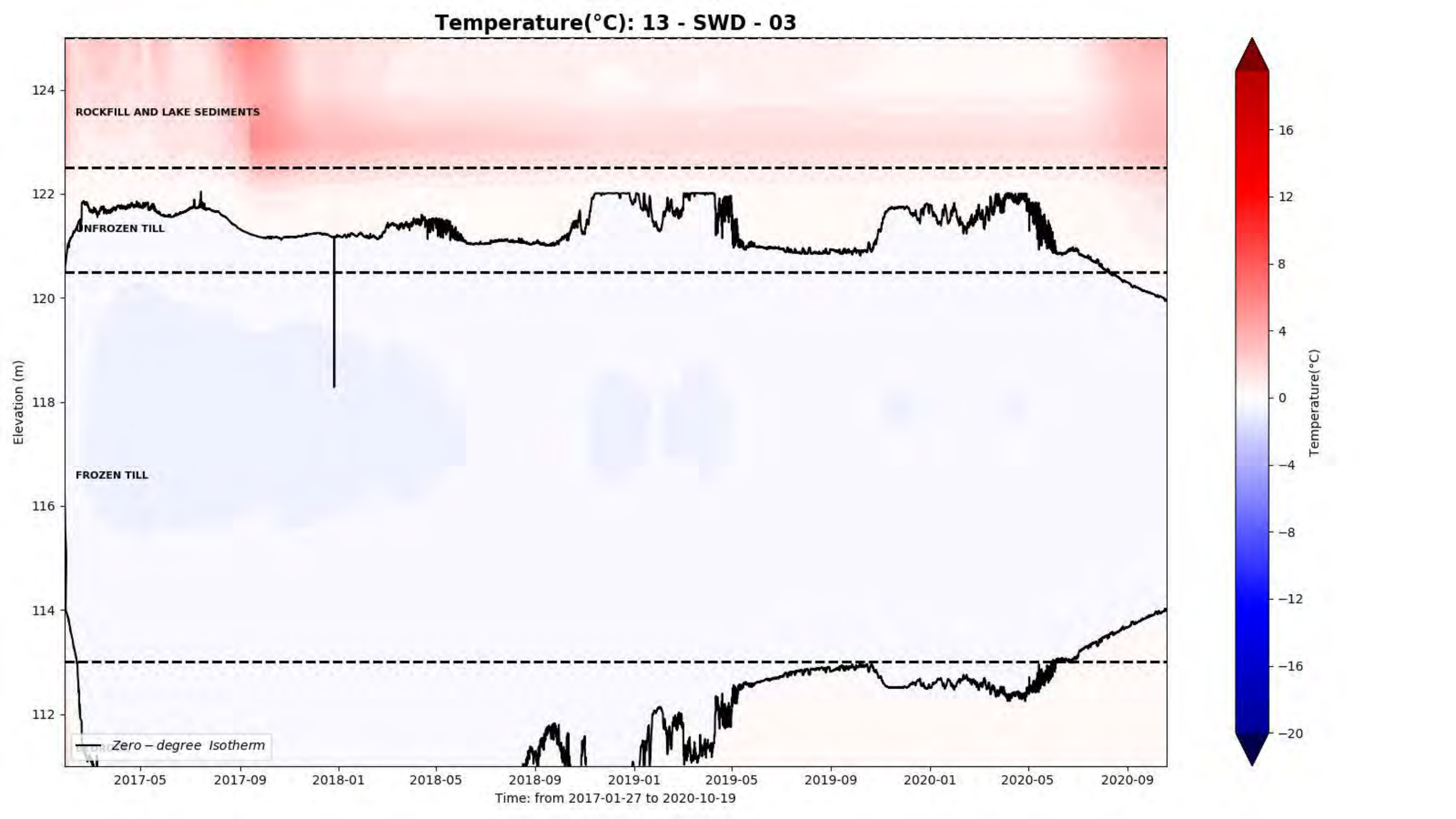

Temperature (°C): 41 - NC - 17 - 08
TAILINGS
Tailings
BEDROCK
Bedrock
Zero – degree Isotherm
Elevation (m)
Time: from 2017-02-21 to 2020-09-23
Temperature (°C)

13 - SWD: SWD_03_16

2 days

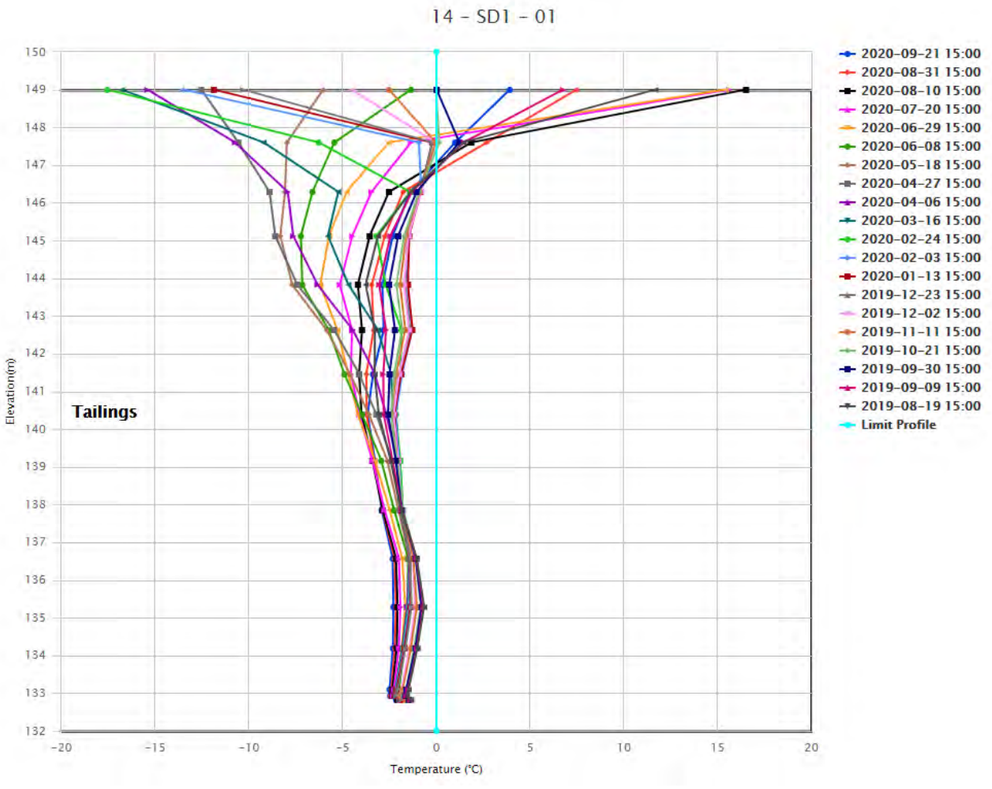
0 0

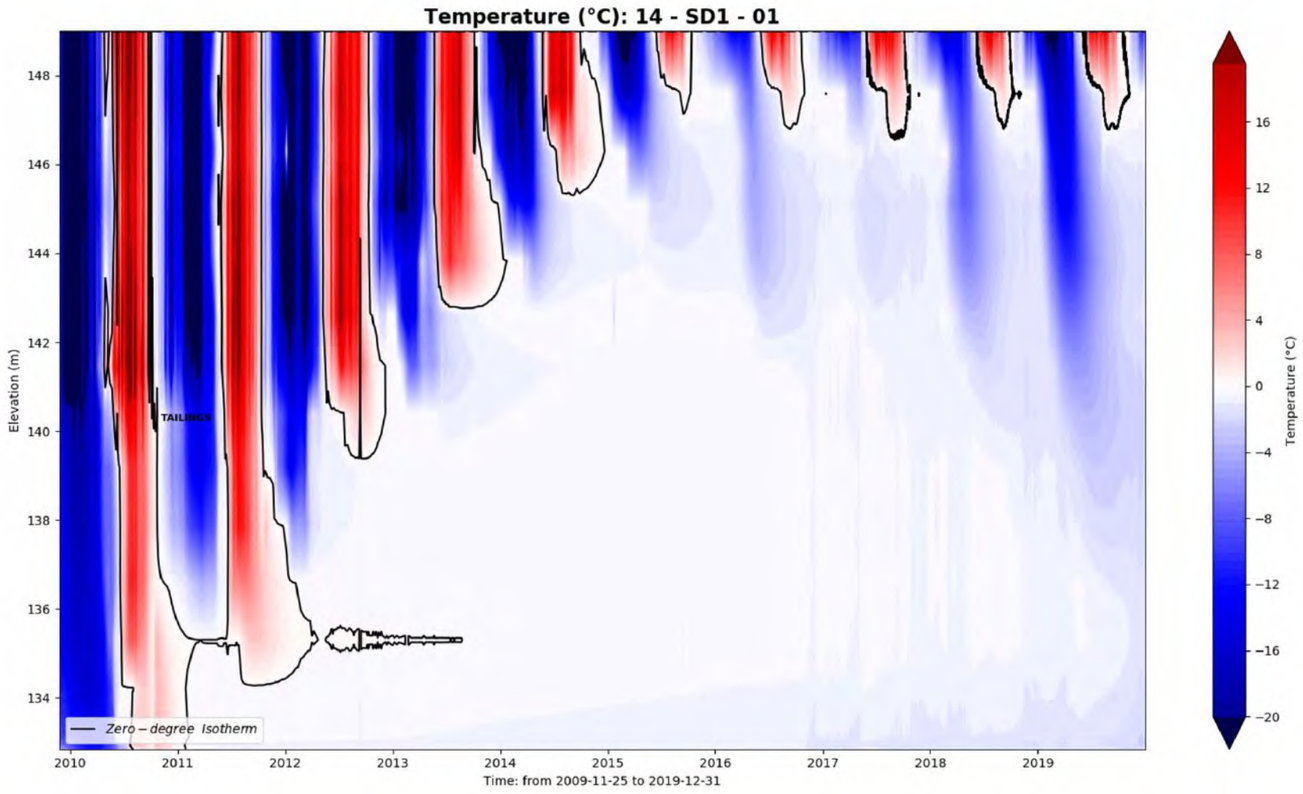


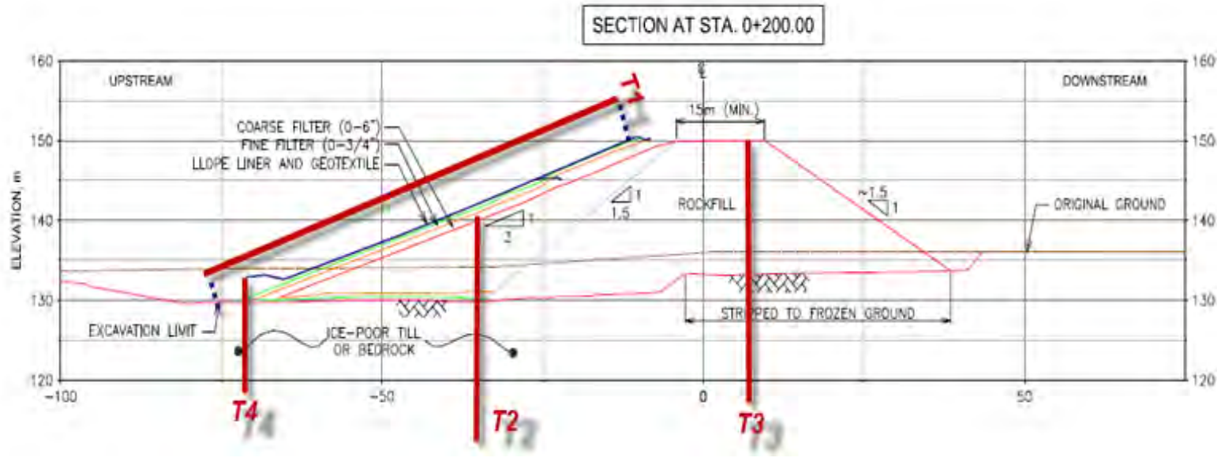

Temperature(°C): 13 - SWD - 03
ROCKFILL AND LAKE SEDIMENTS
UNFROZEN TILL
FROZEN TILL
Zero – degree Isotherm
Elevation (m)
124
122
120
118
116
114
112
2017-05
2017-09
2018-01
2018-05
2018-09
2019-01
2019-05
2019-09
2020-01
2020-05
2020-09
Time: from 2017-01-27 to 2020-10-19
16
12
8
4
0
−4
−8
−12
−16
−20
Temperature(°C)

Saddle Dam 1 T1



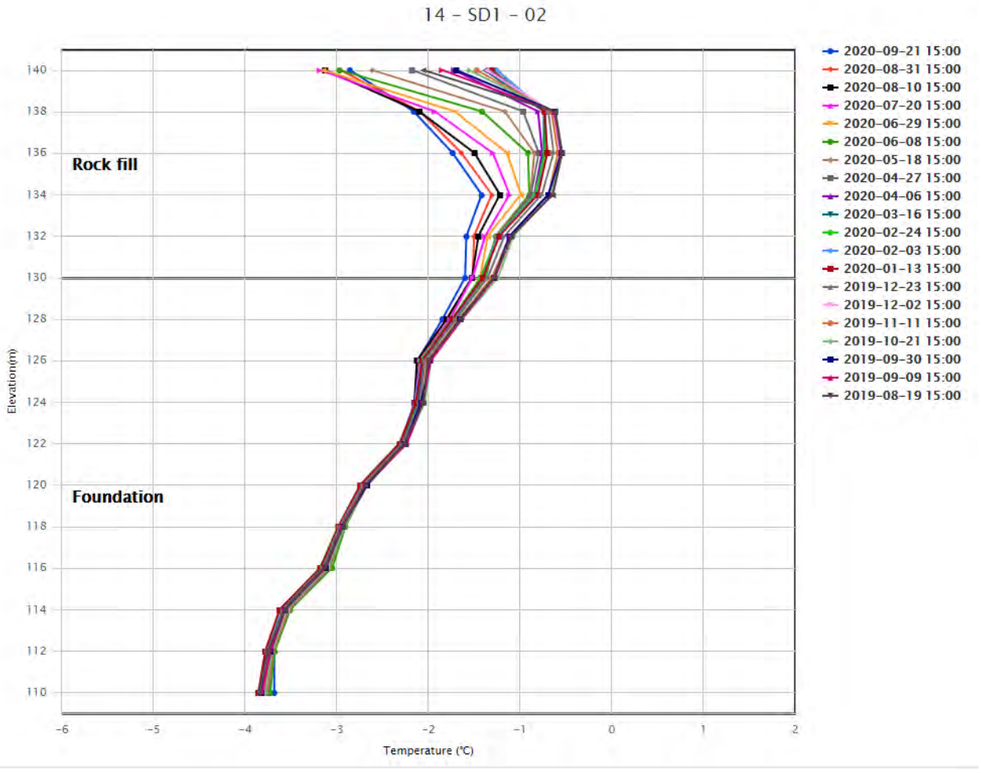


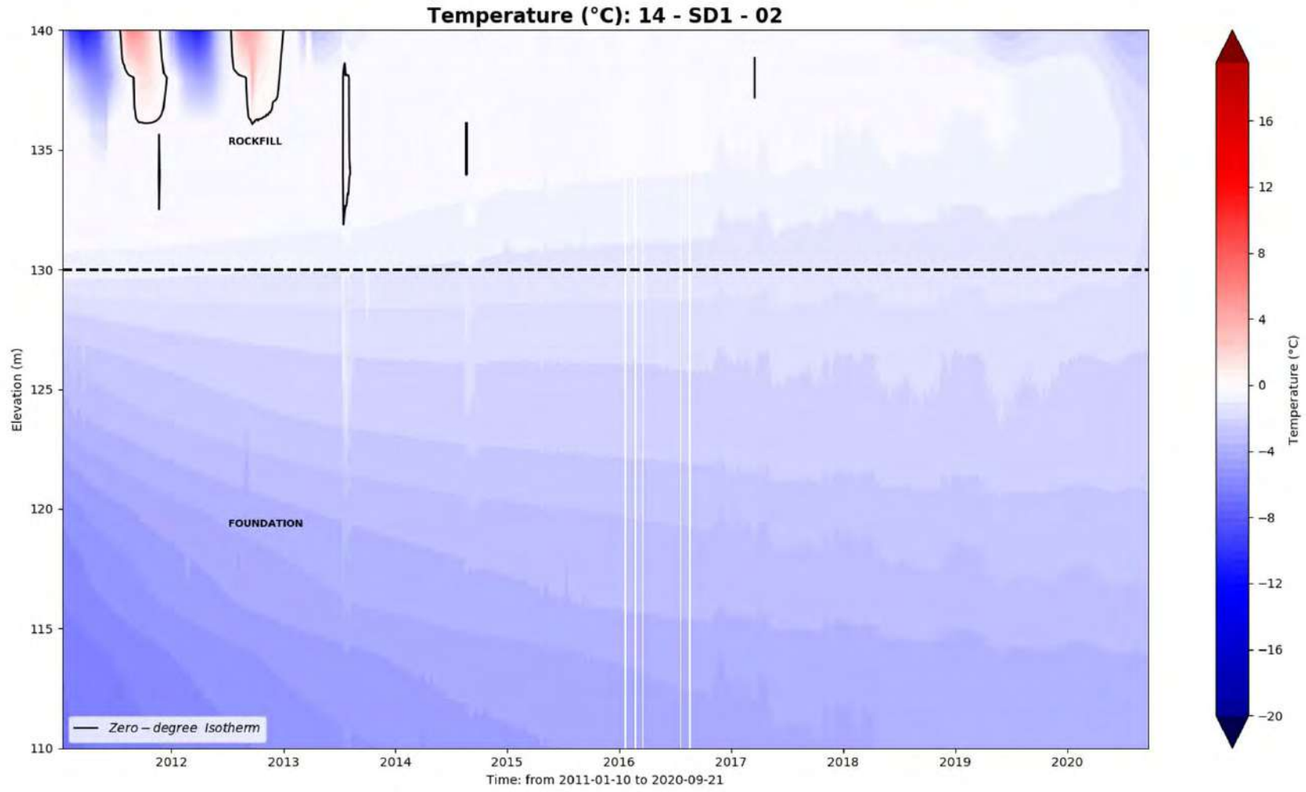


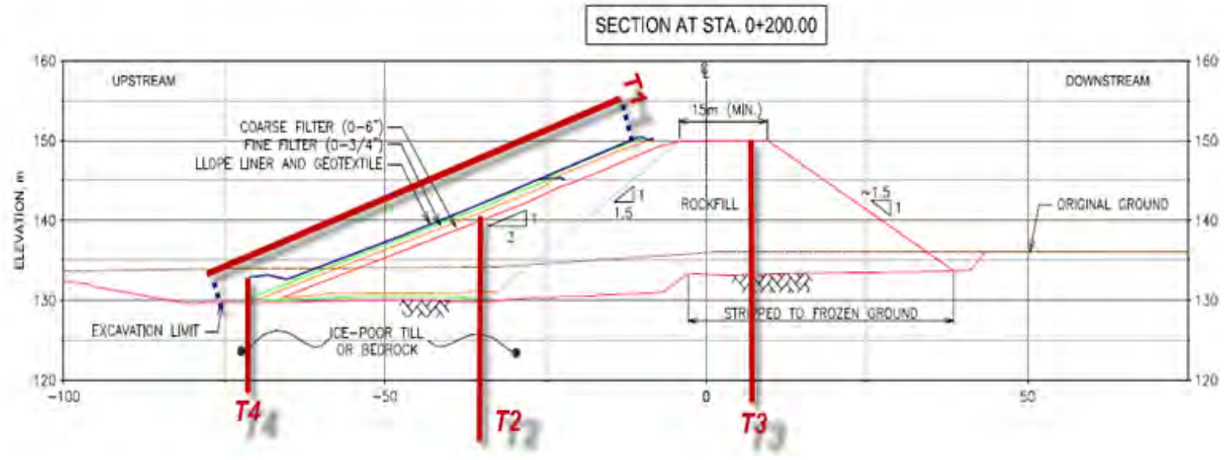


Saddle Dam 1 T2



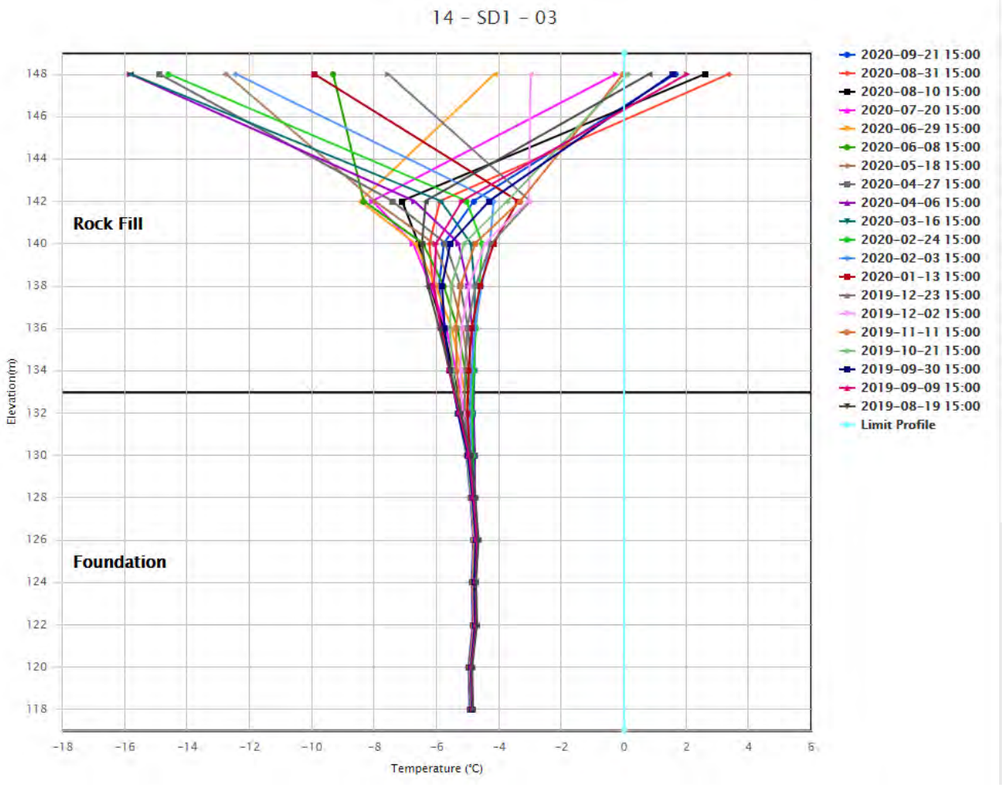


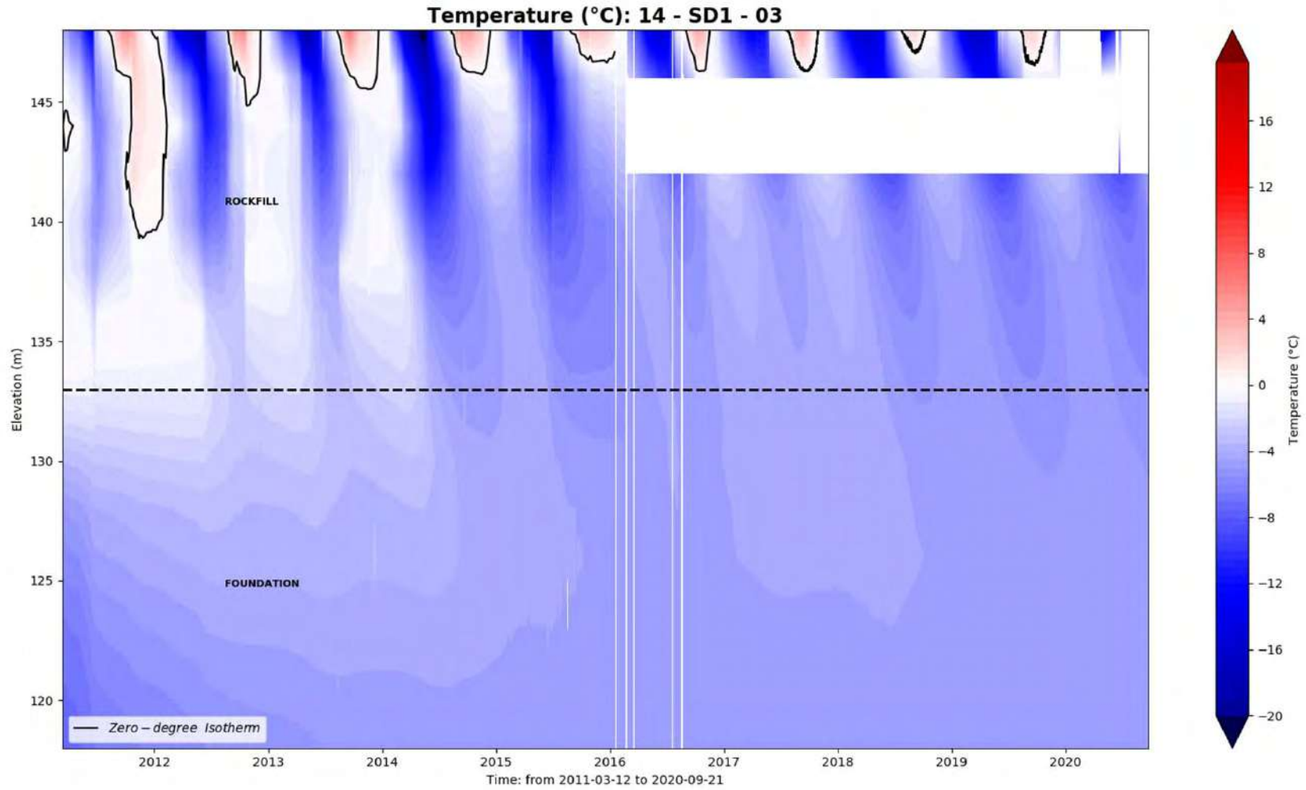


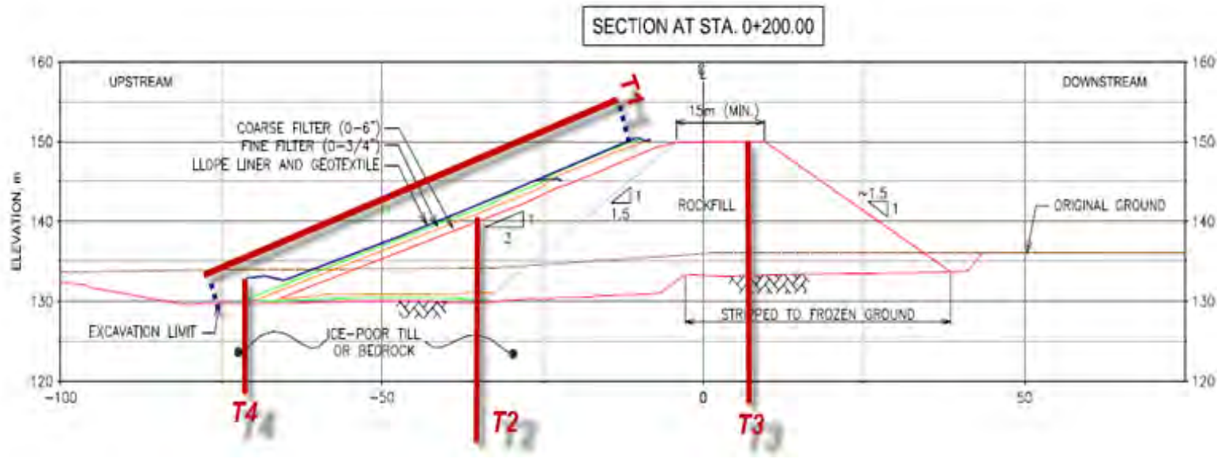


Saddle Dam 1 T3



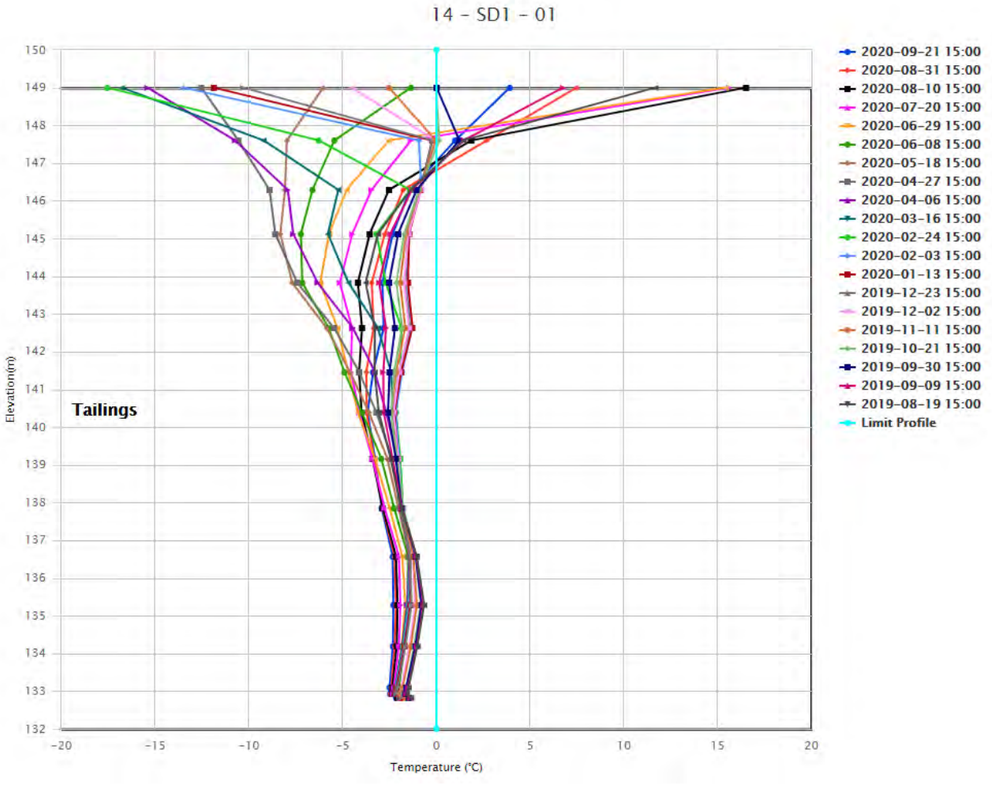


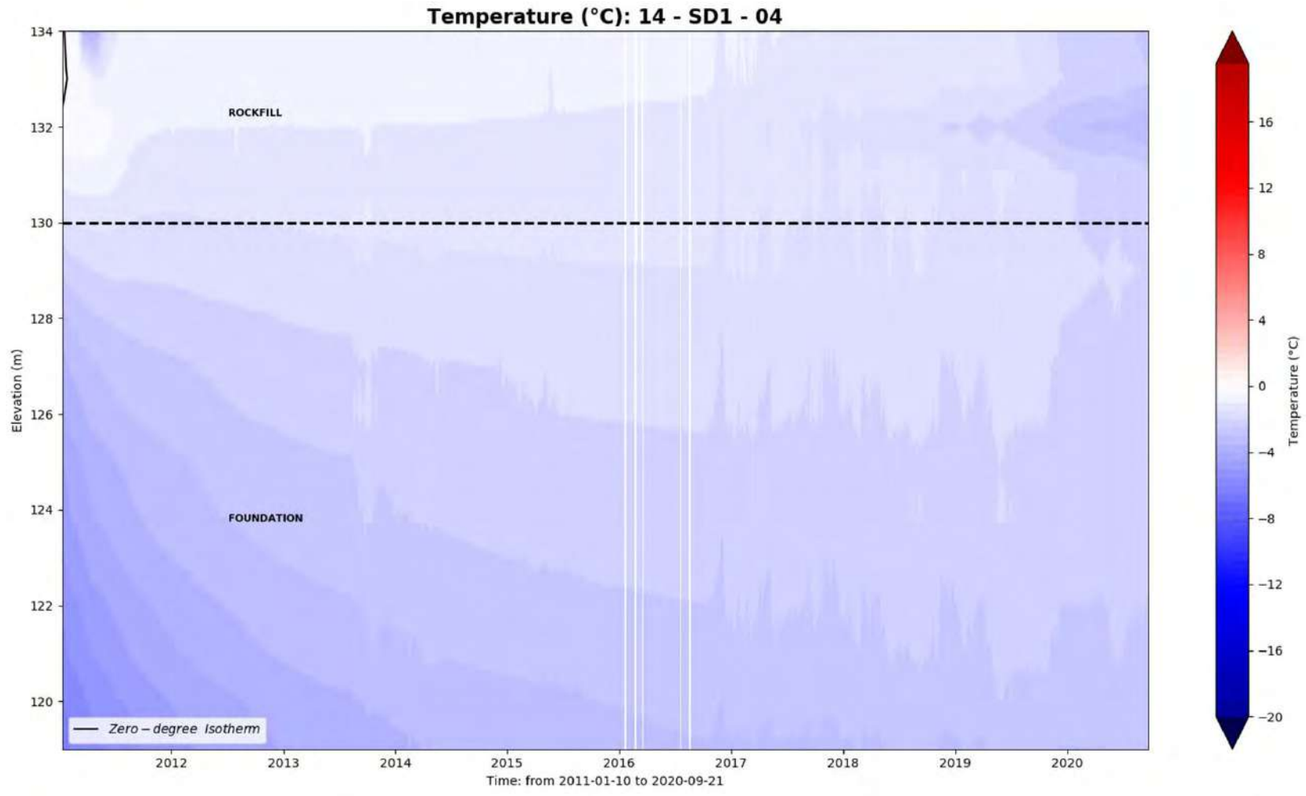


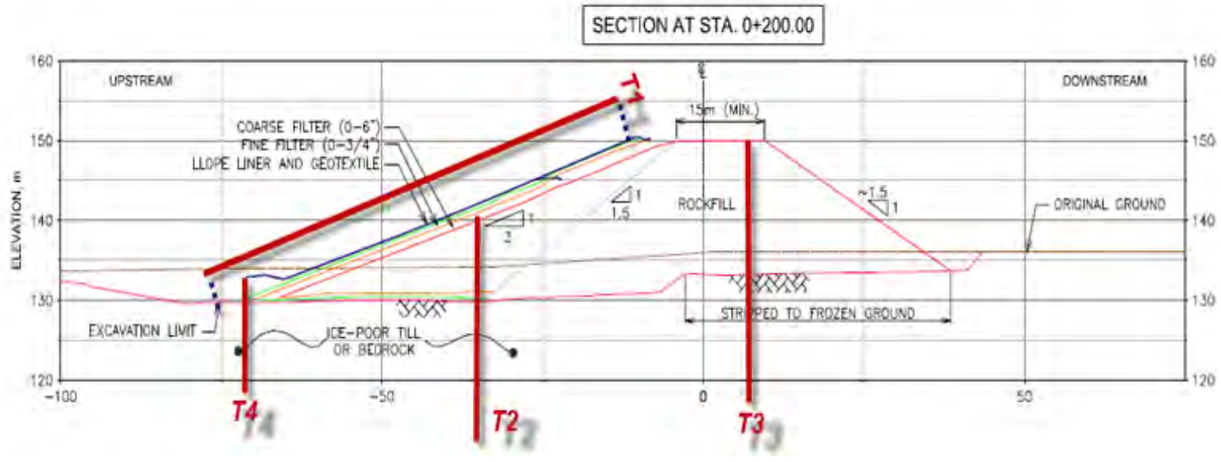


Saddle Dam 1 T4



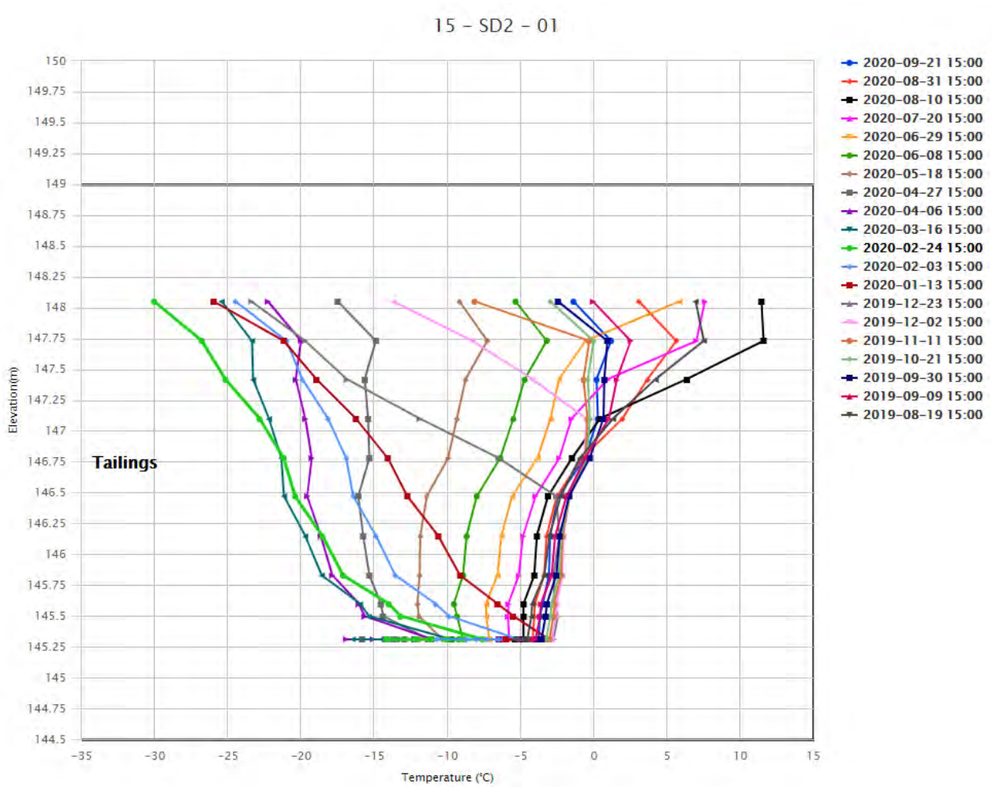


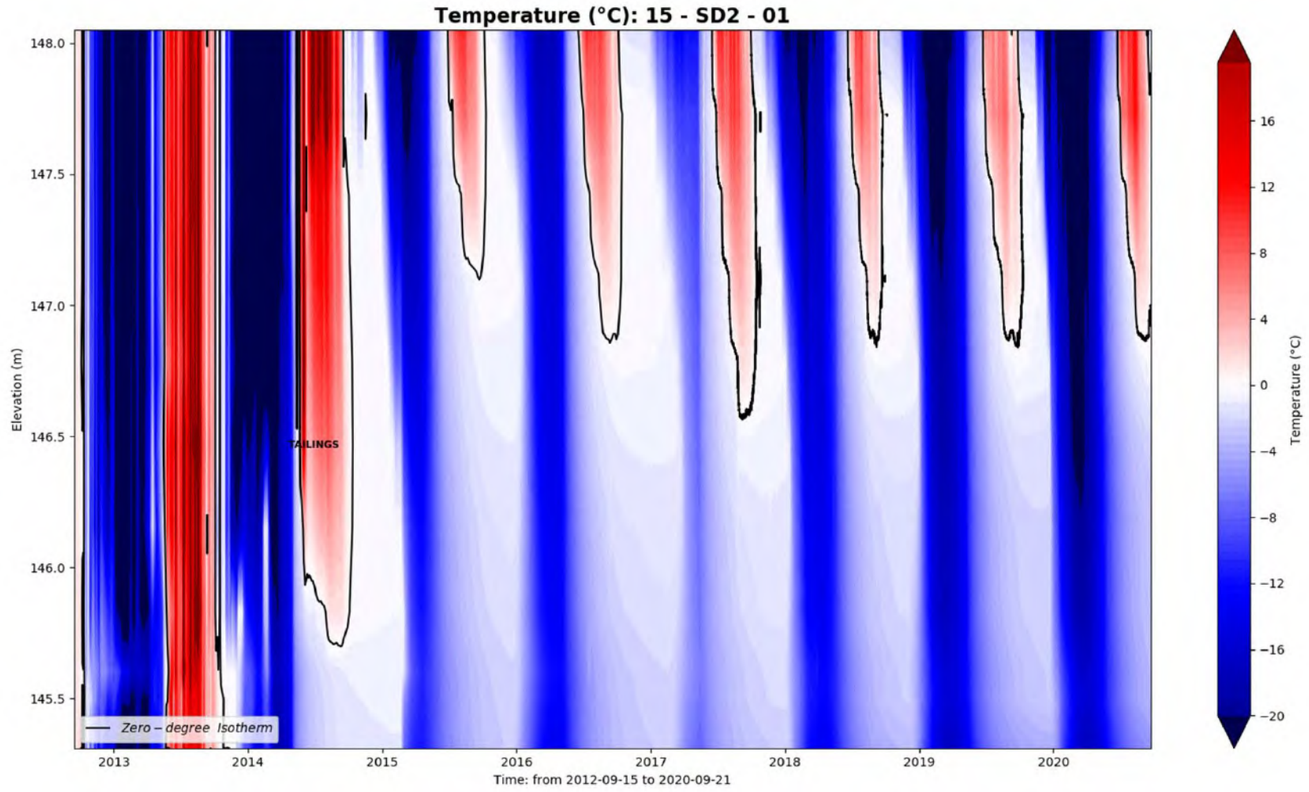


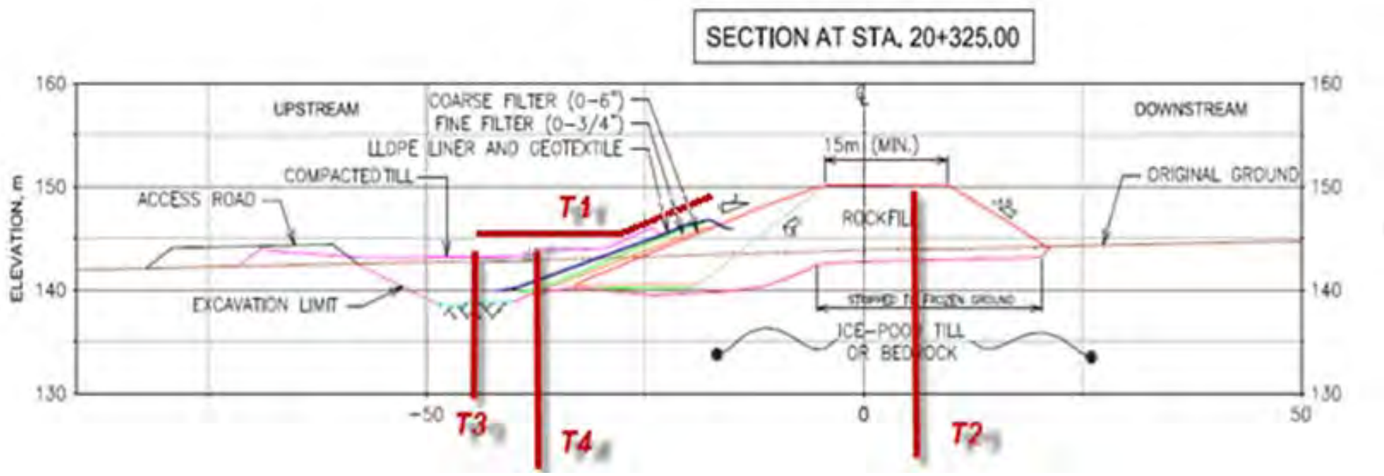


Saddle Dam 2 T1

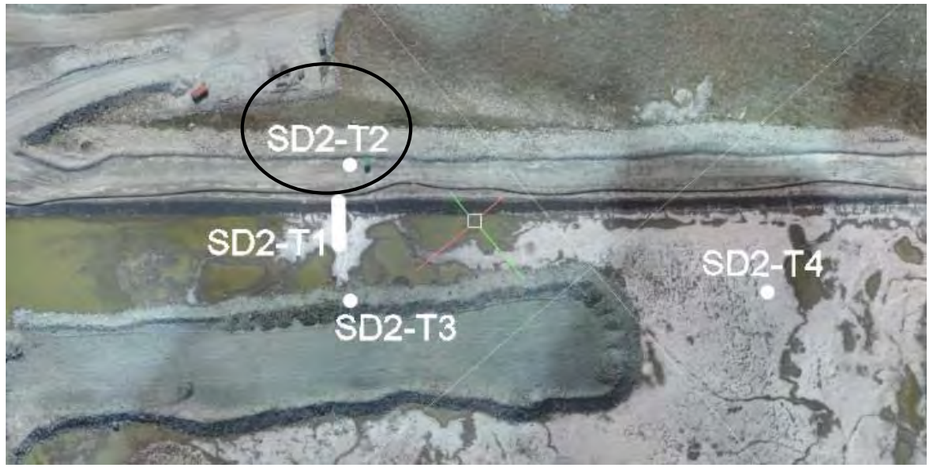


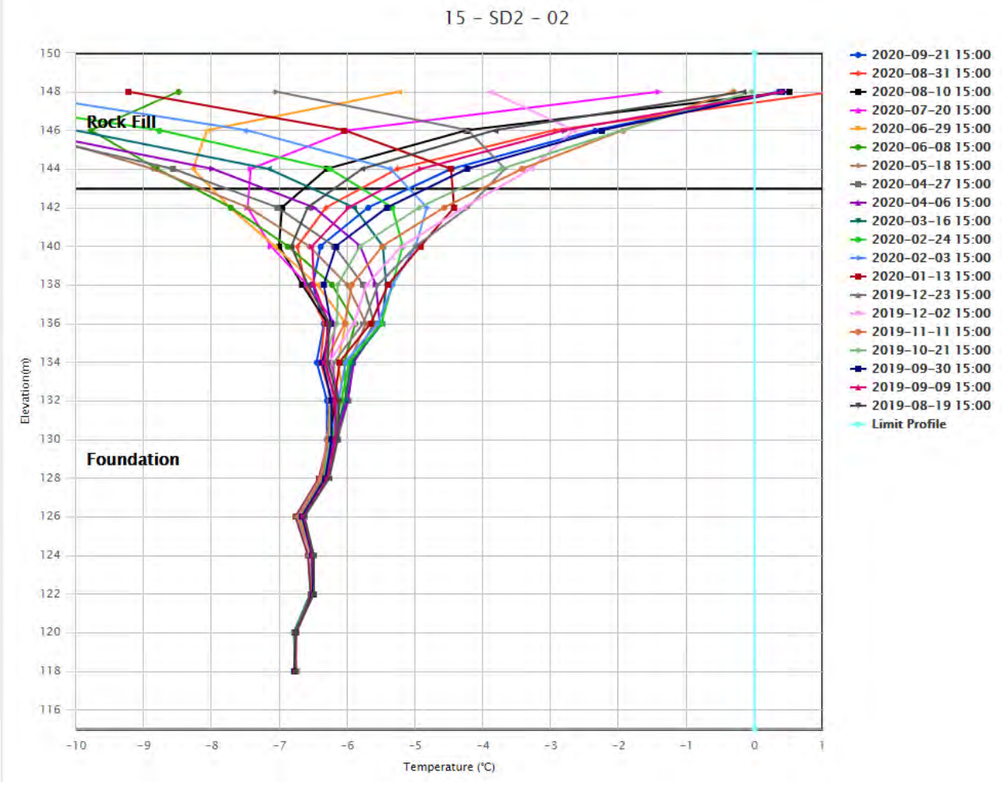


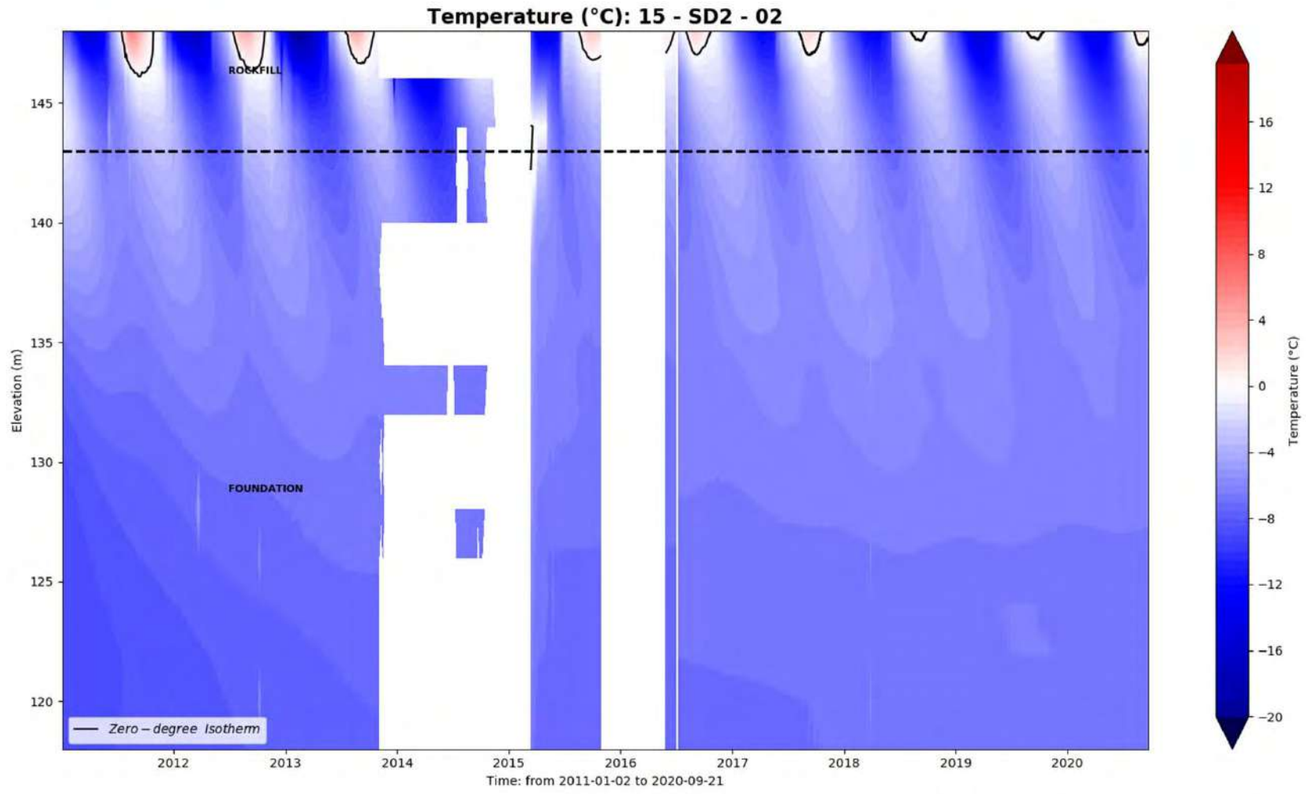


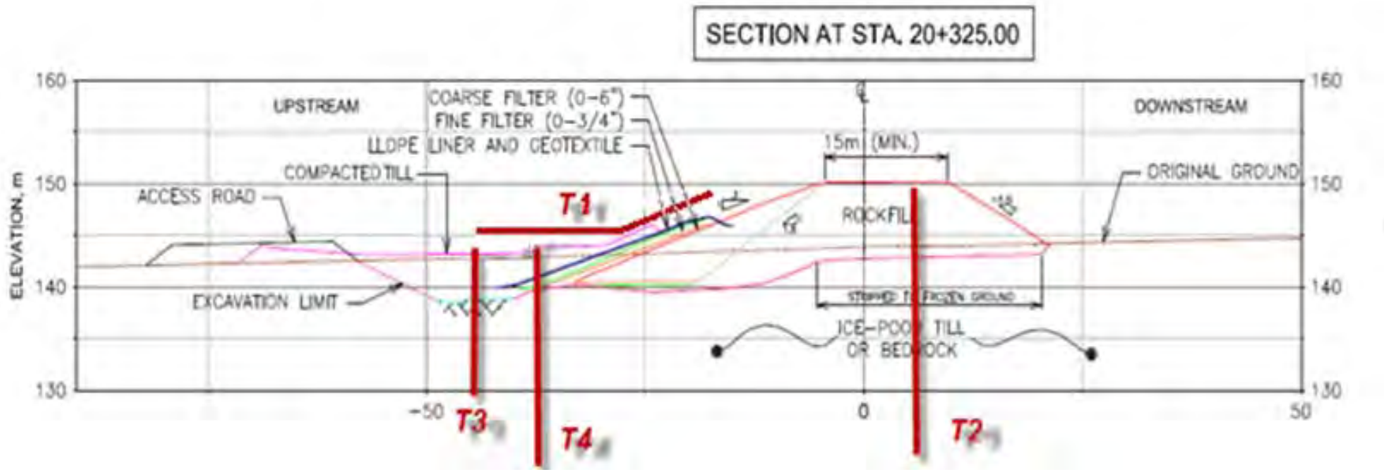


Saddle Dam 2 T2

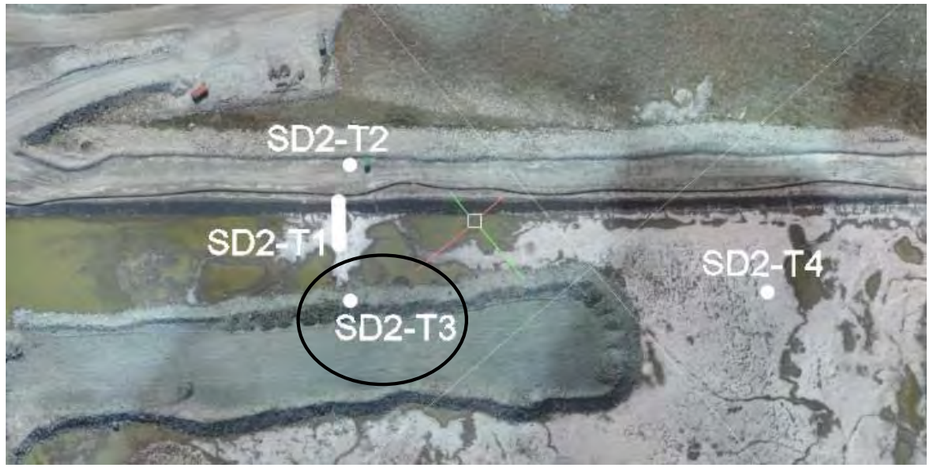


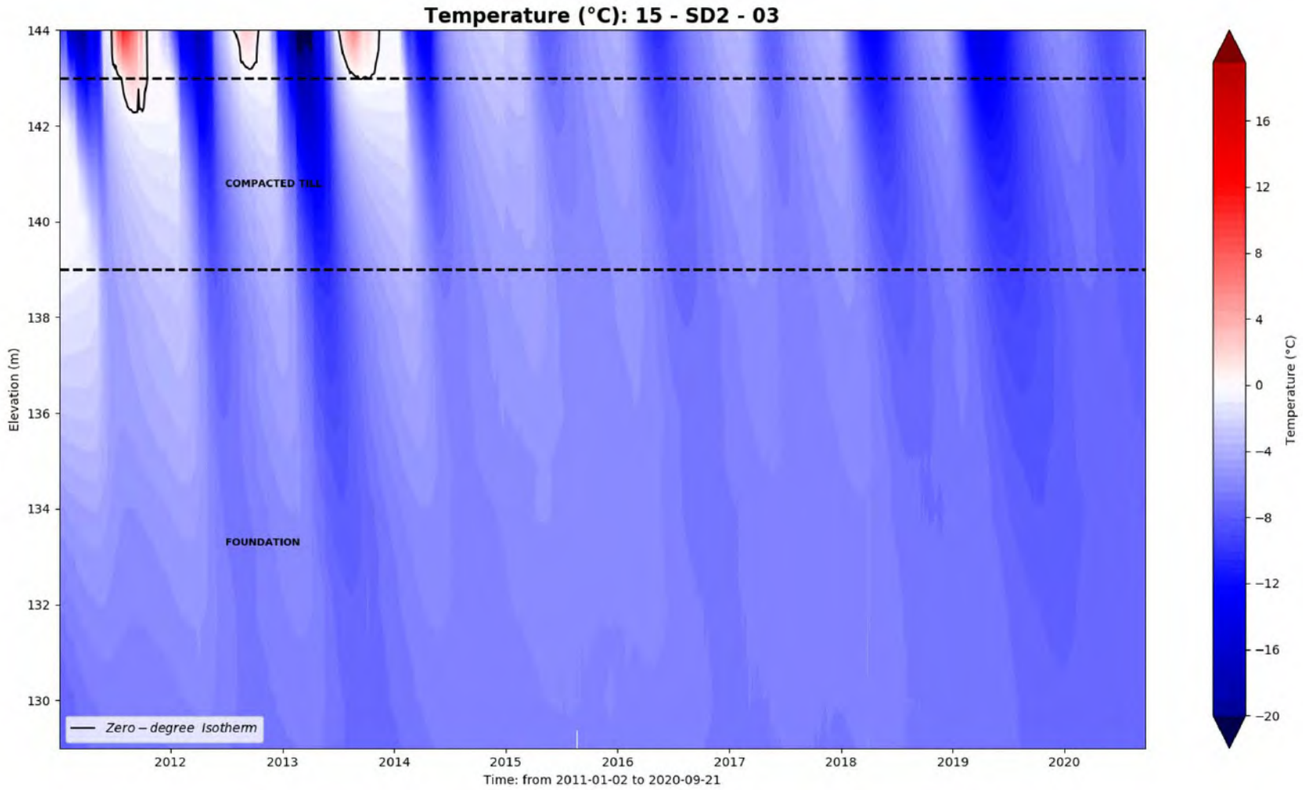


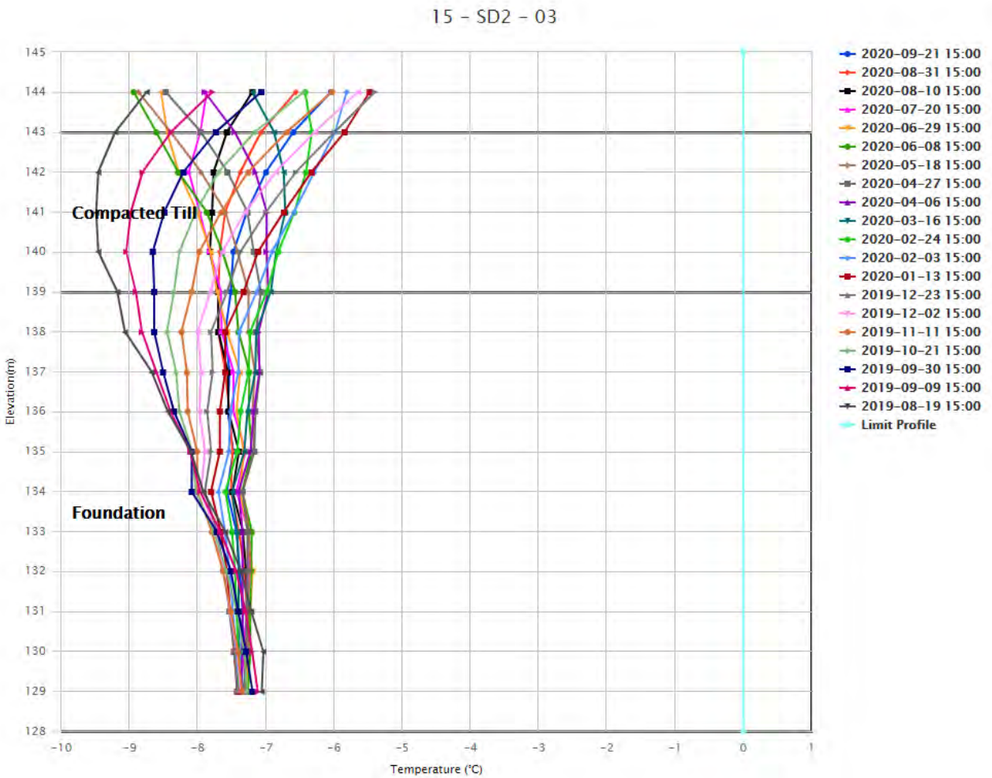


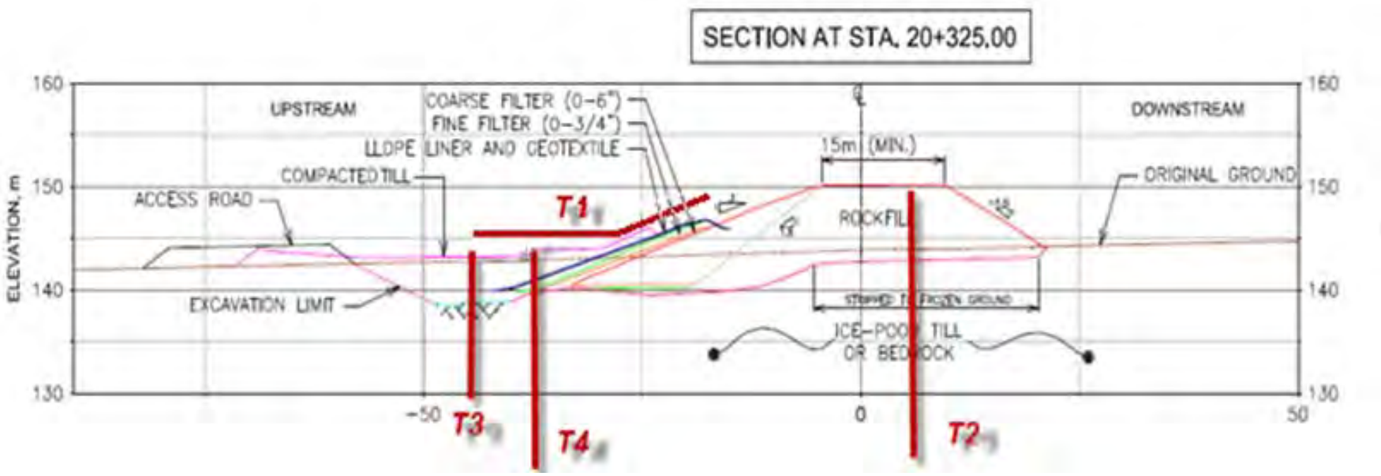


Saddle Dam 2 T3

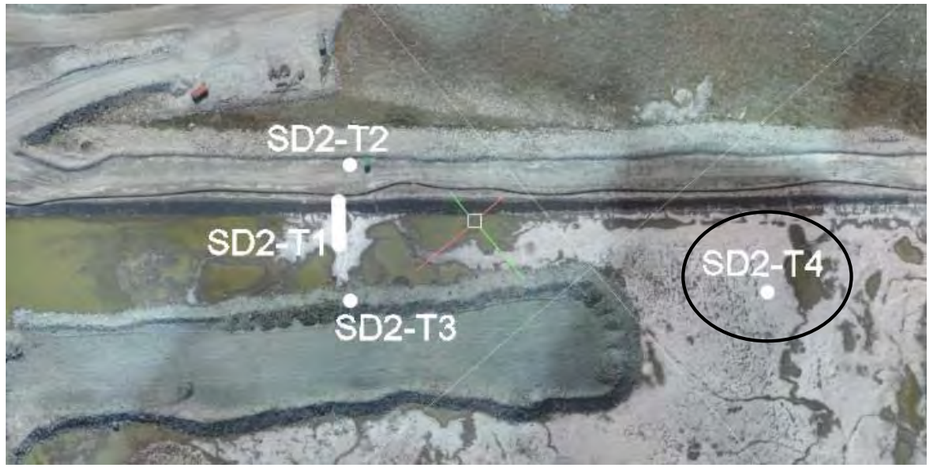


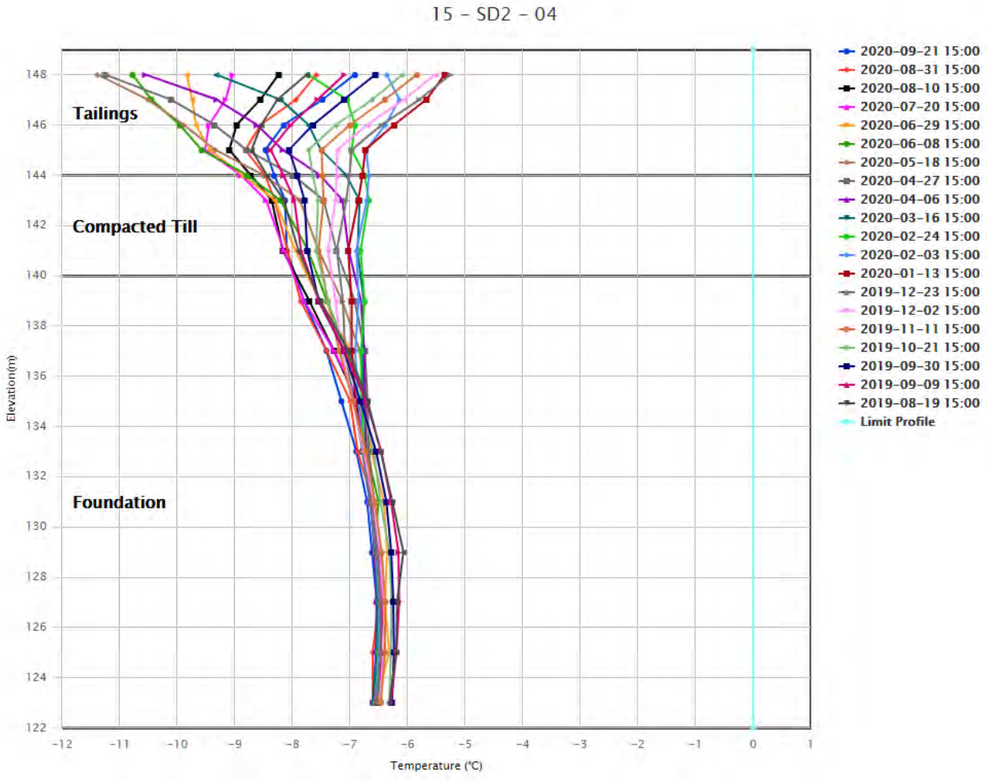


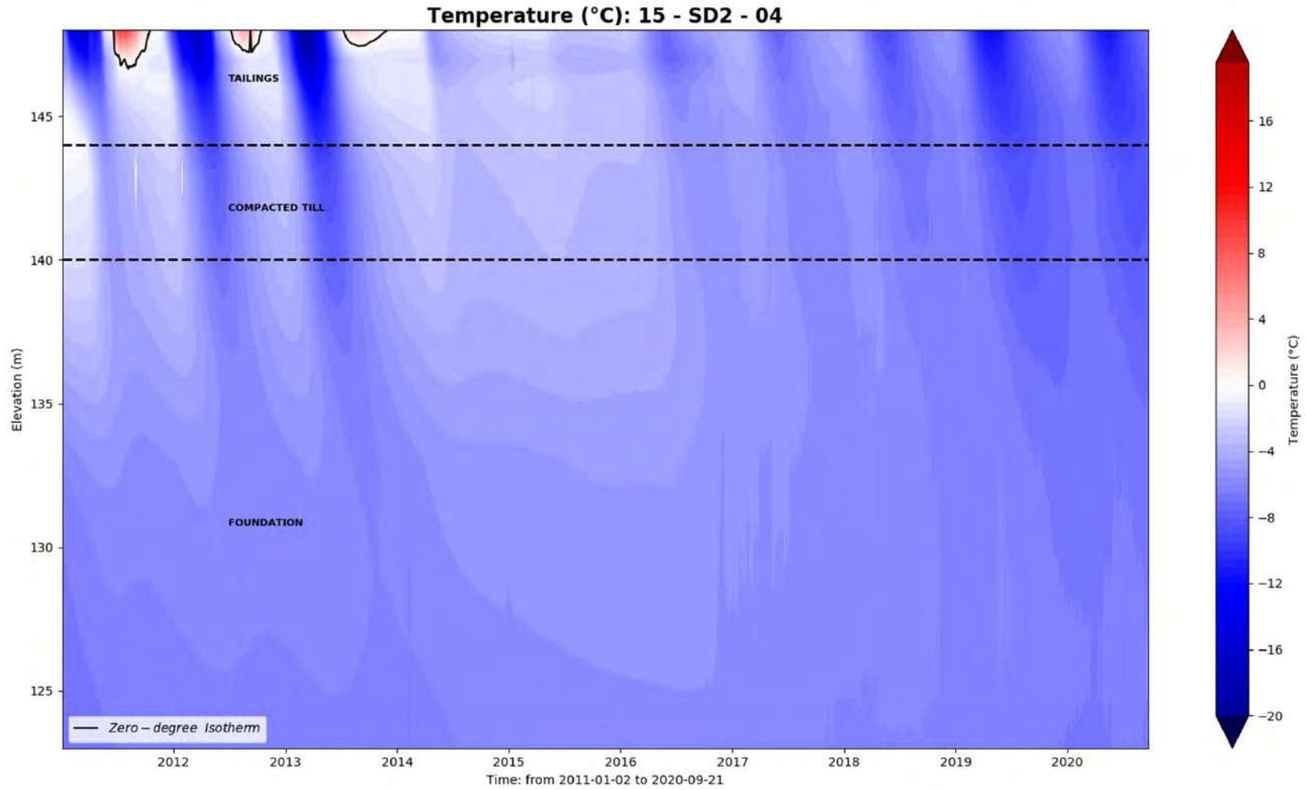


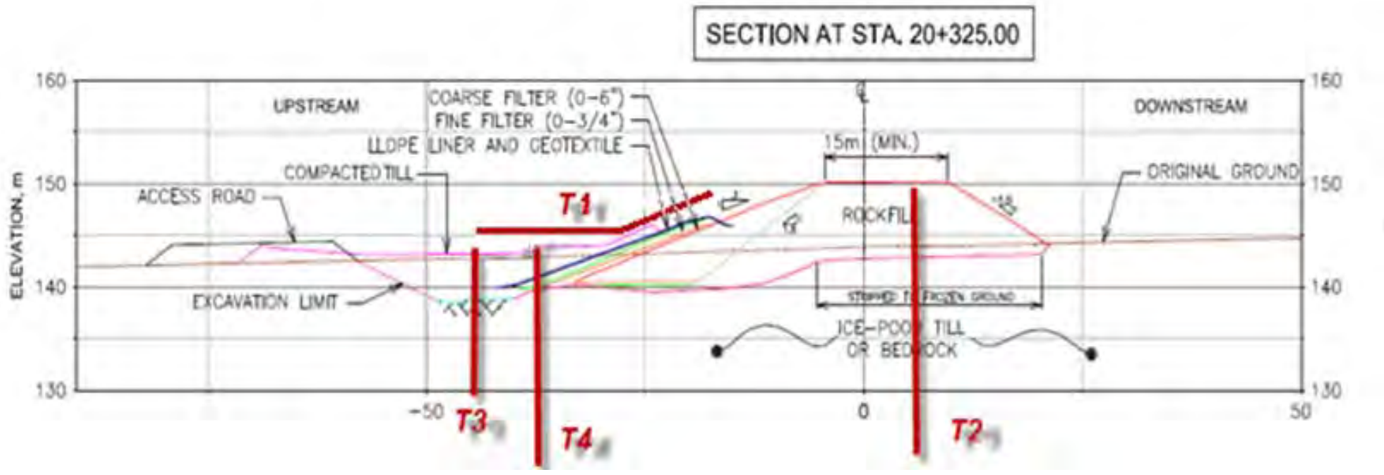


Saddle Dam 2 T4



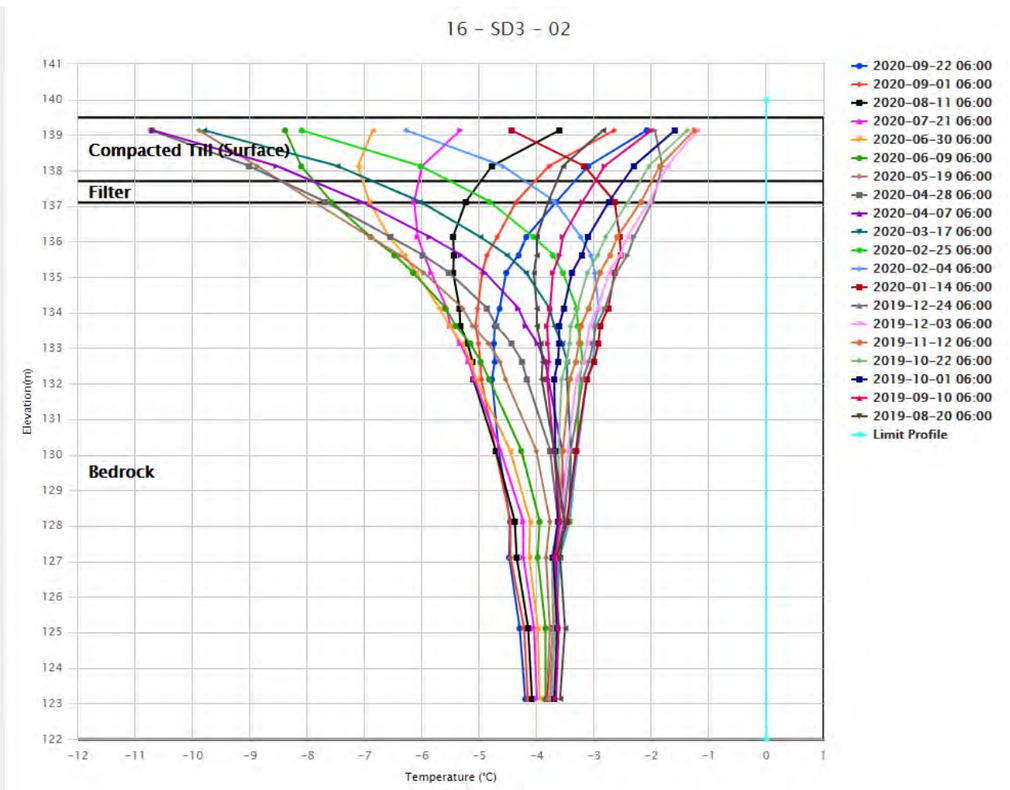


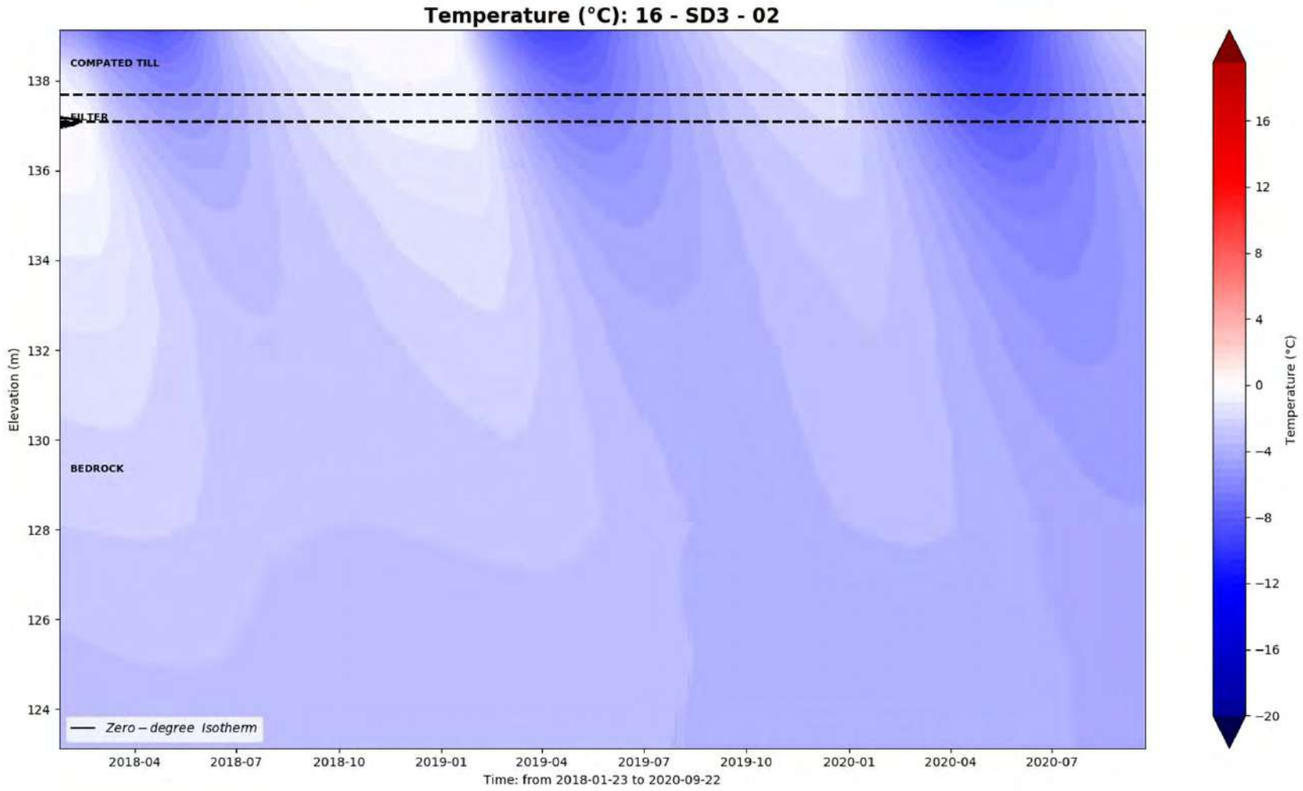


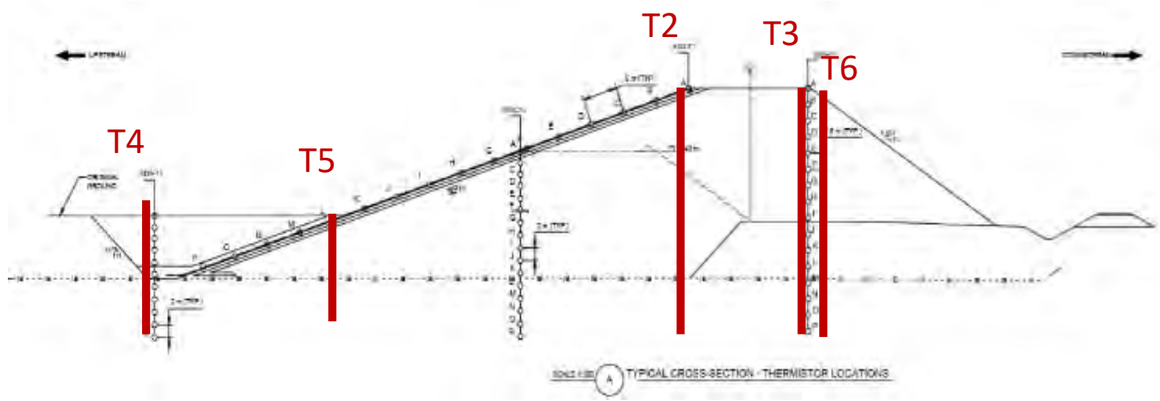


Saddle Dam 3 T2



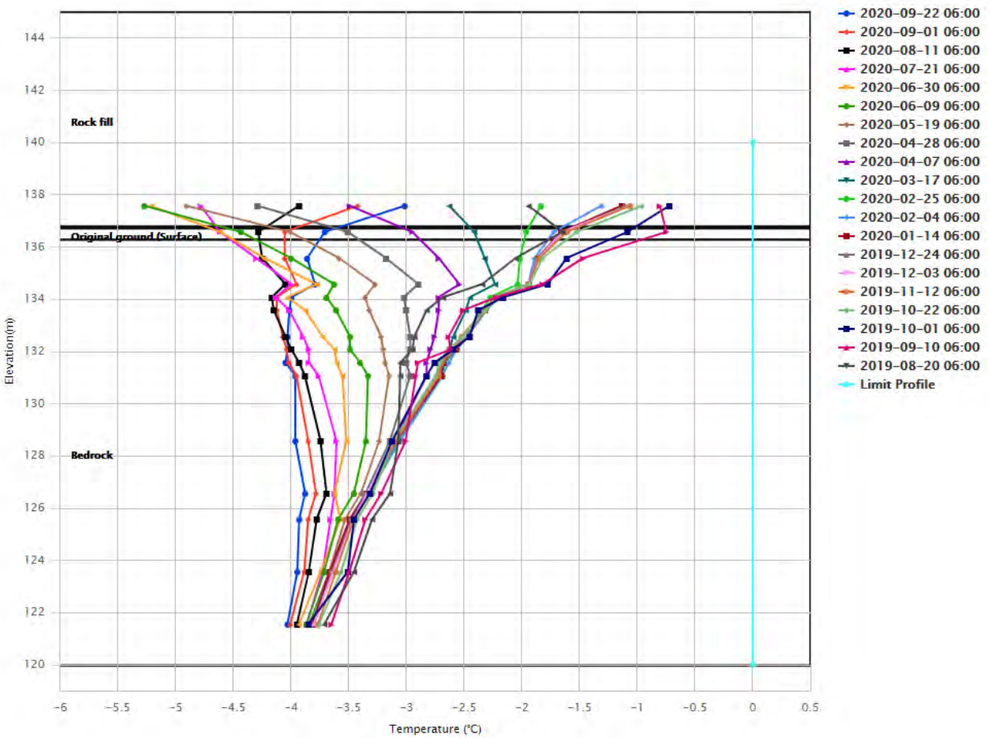


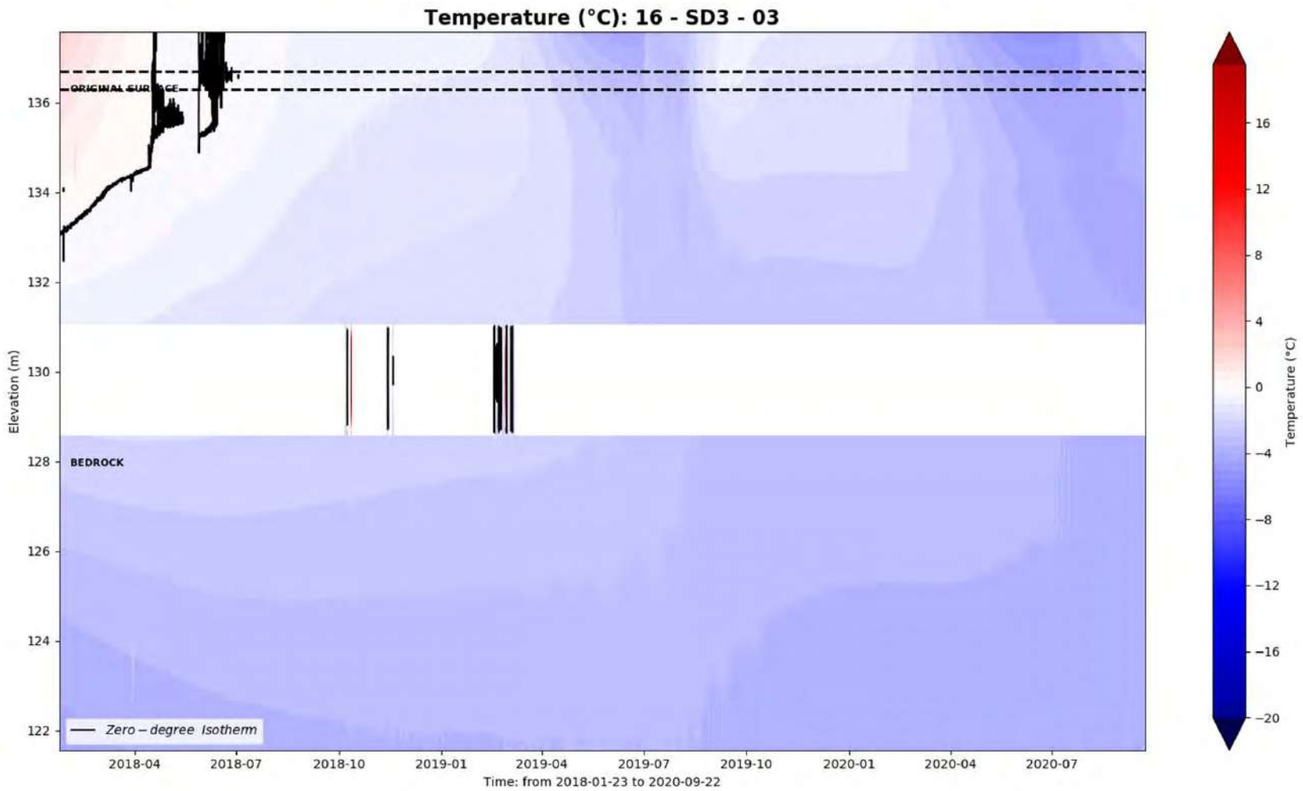


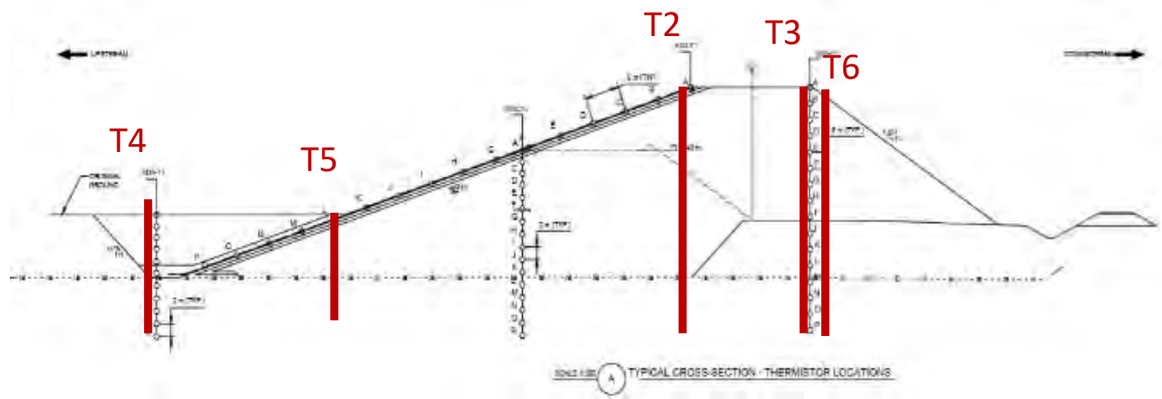


Saddle Dam 3 T3



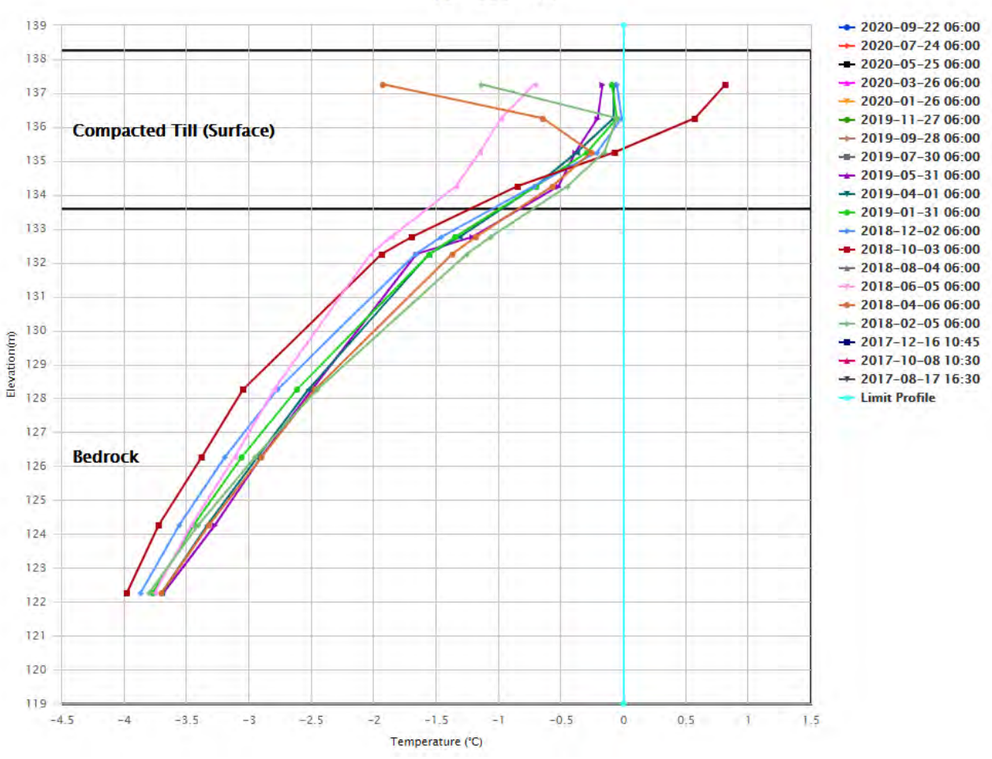


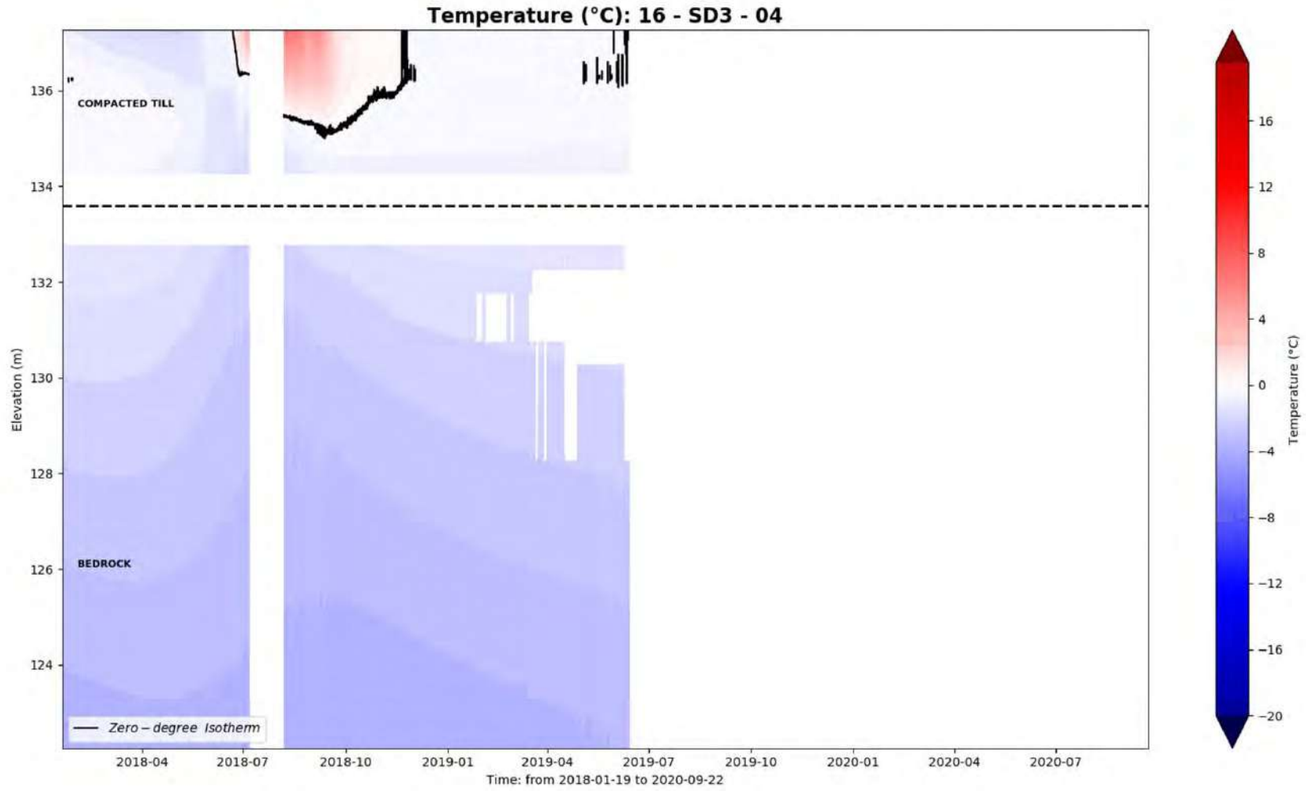


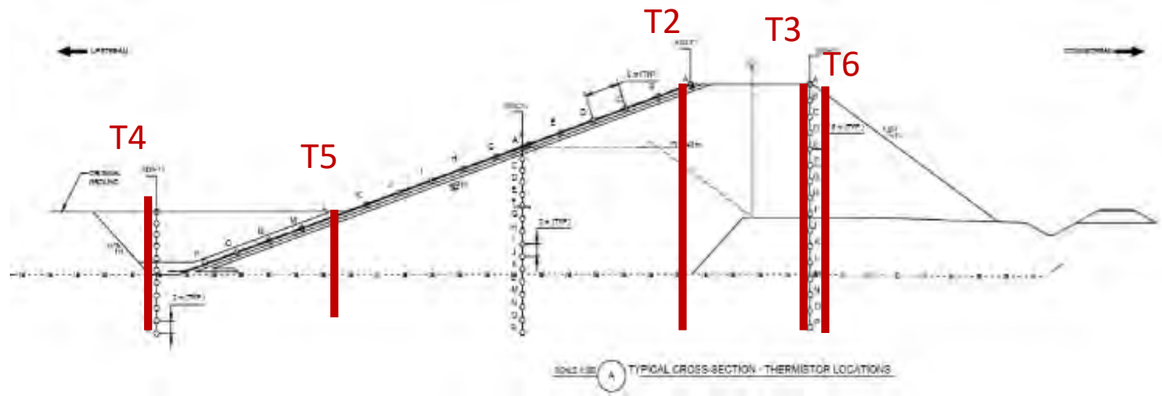


Saddle Dam 3 T4



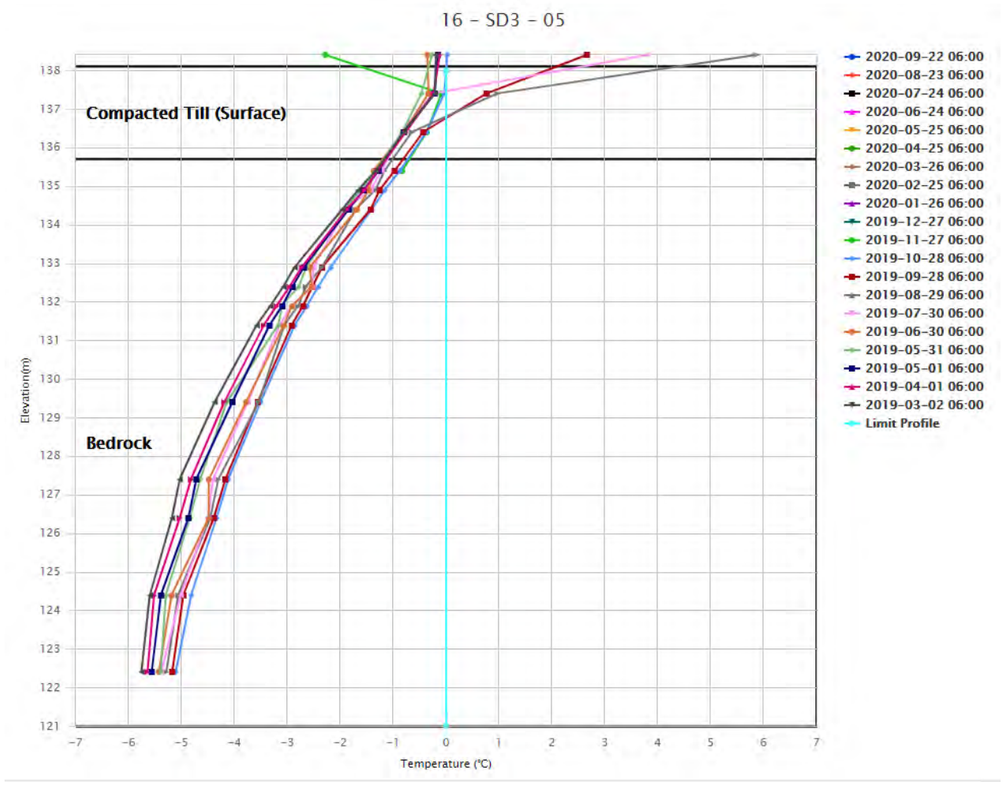


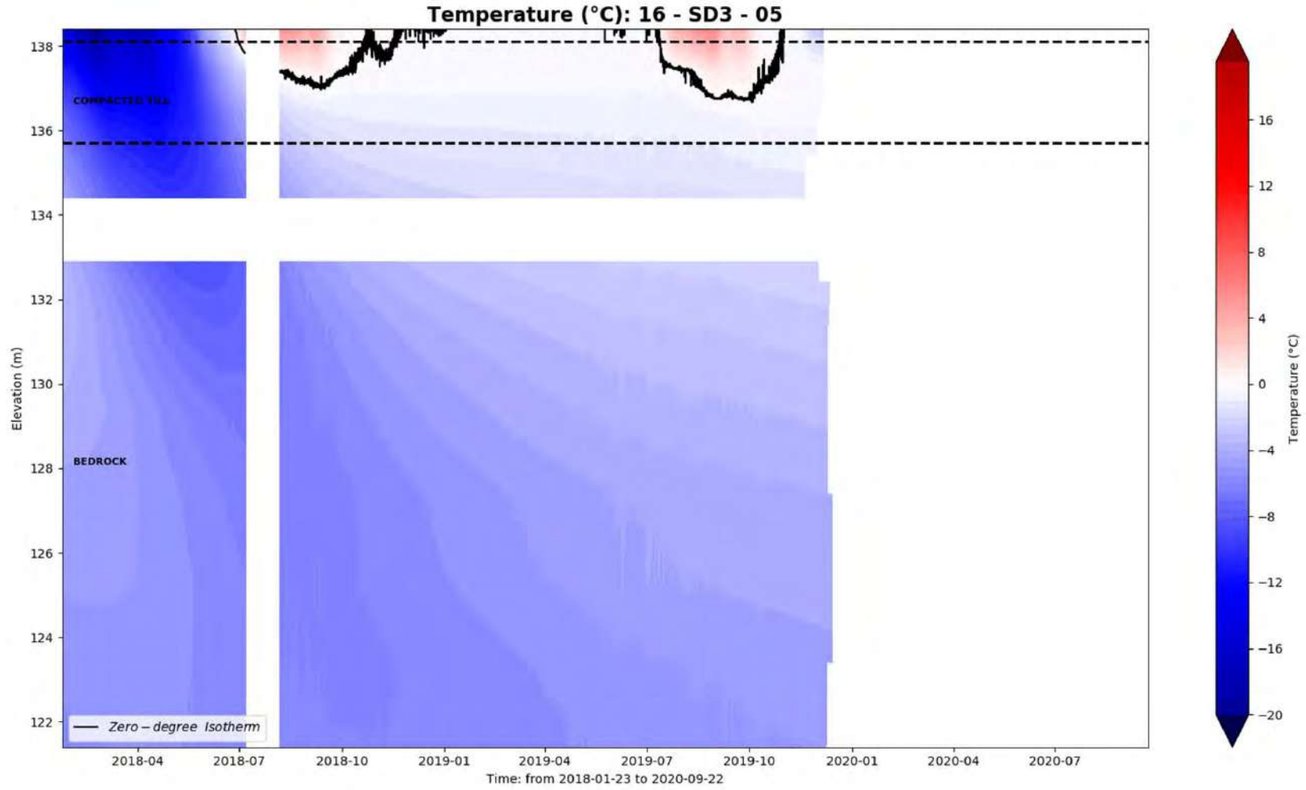


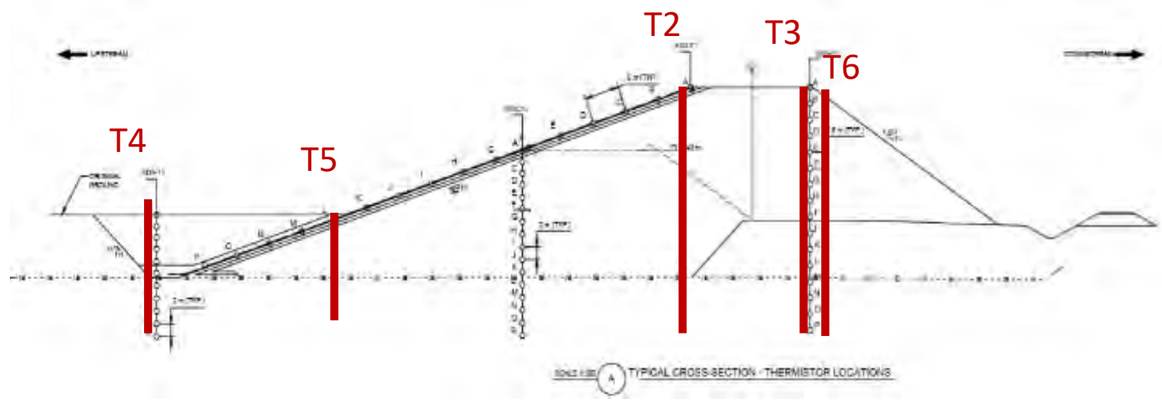


Saddle Dam 3 T5



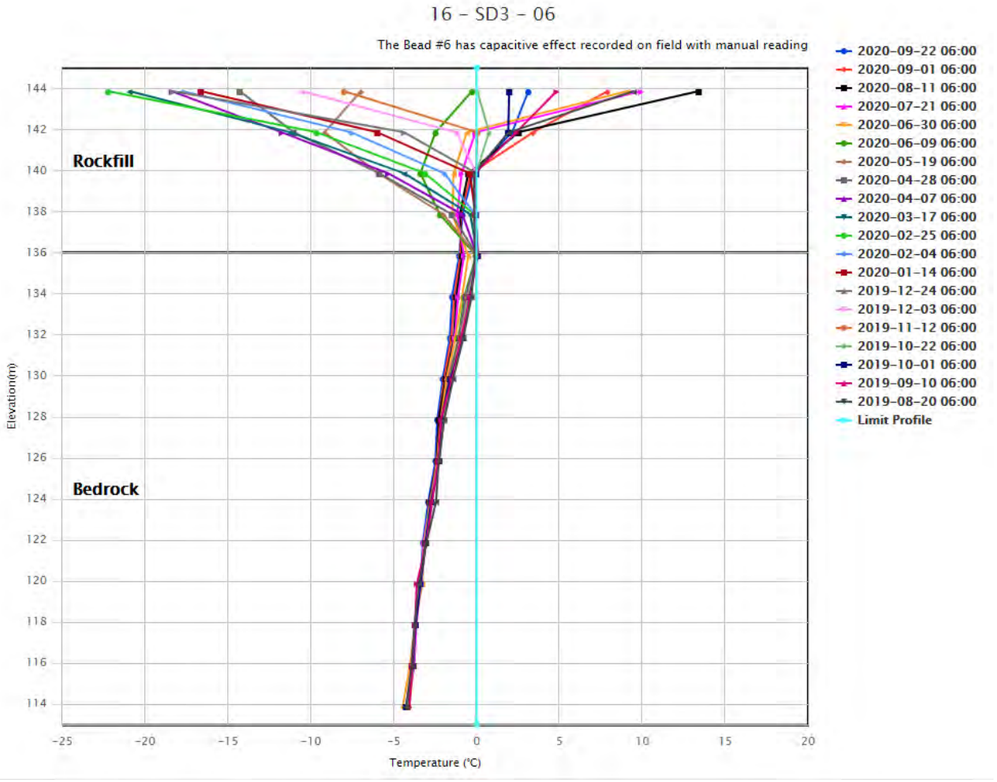


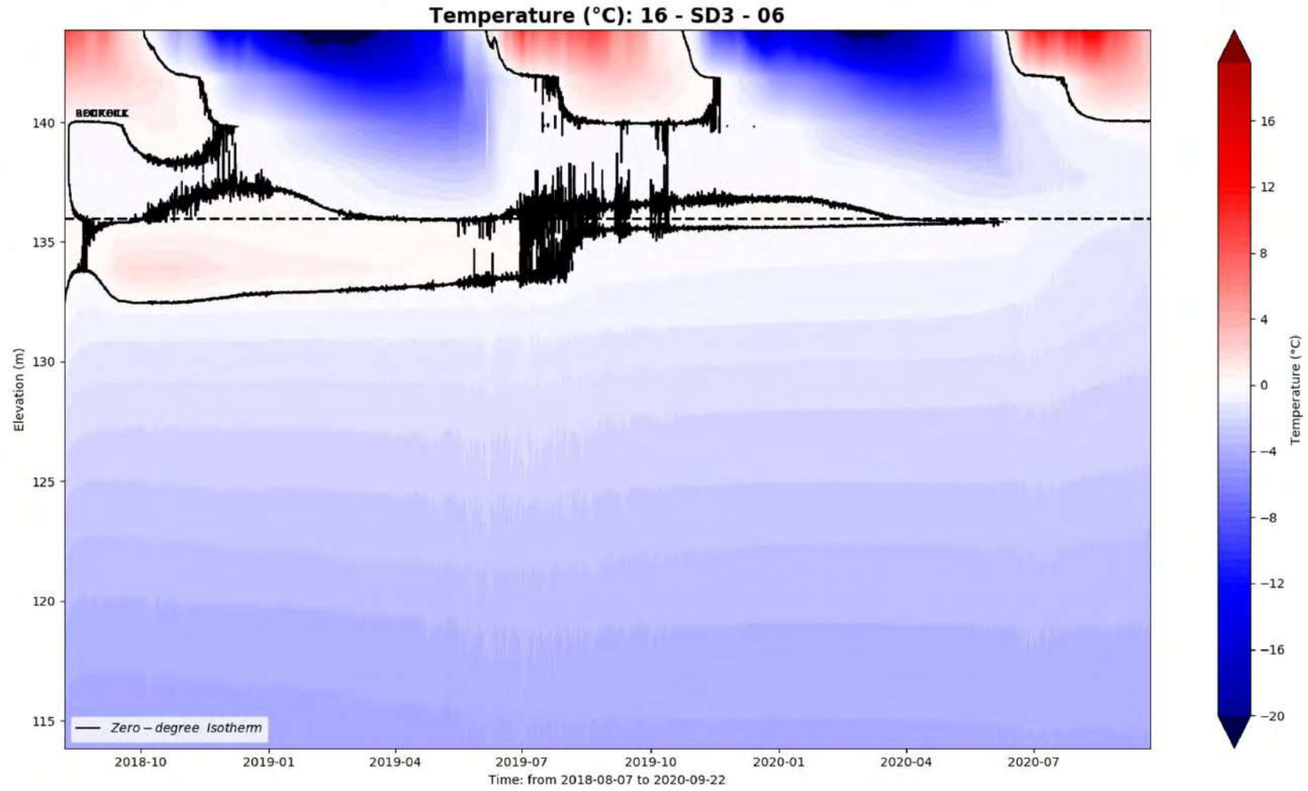


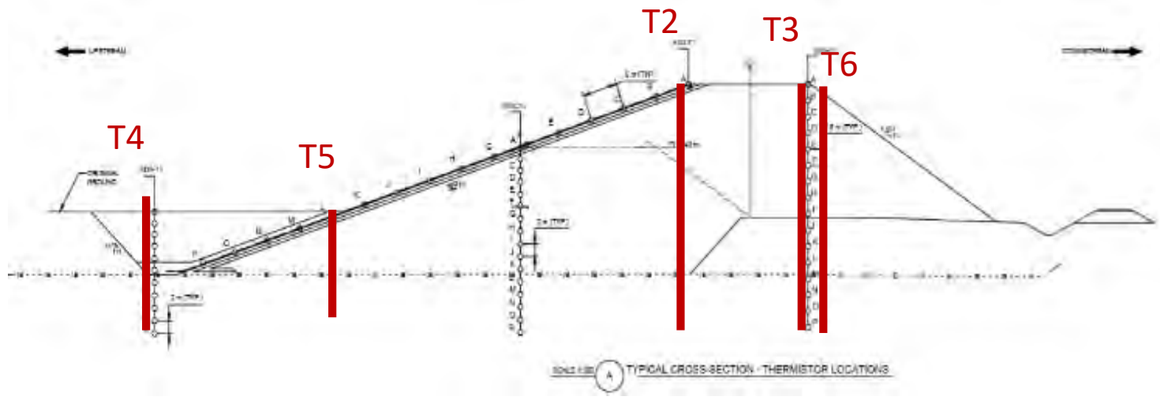


Saddle Dam 3 T6



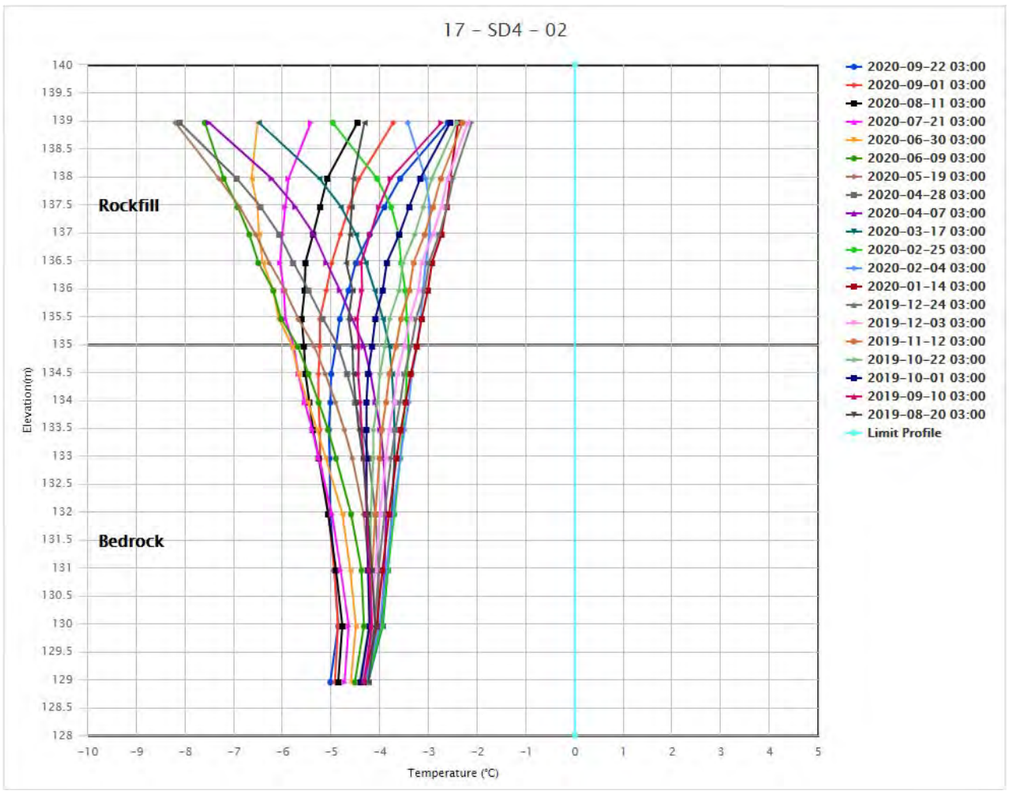


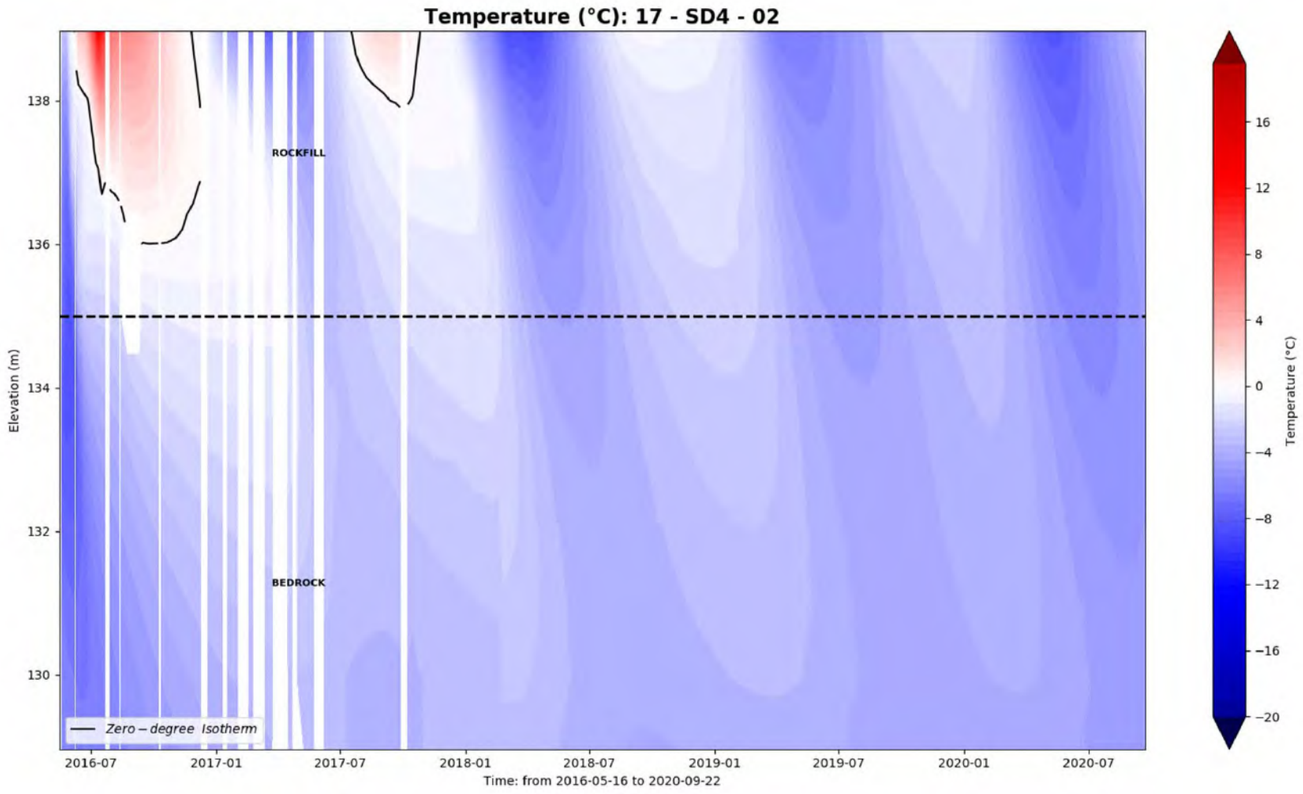


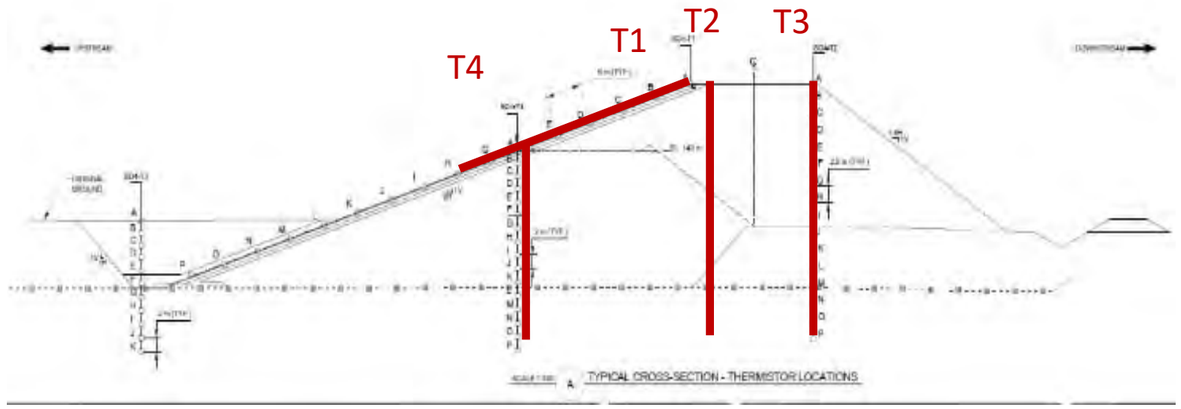


Saddle Dam 4 T2



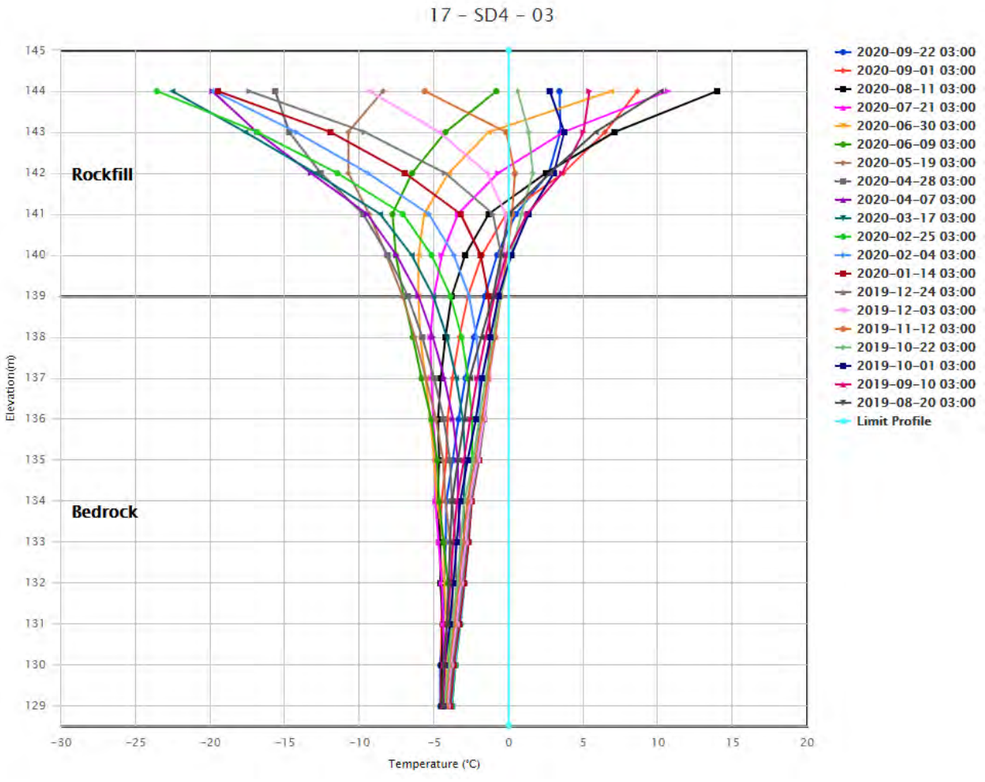


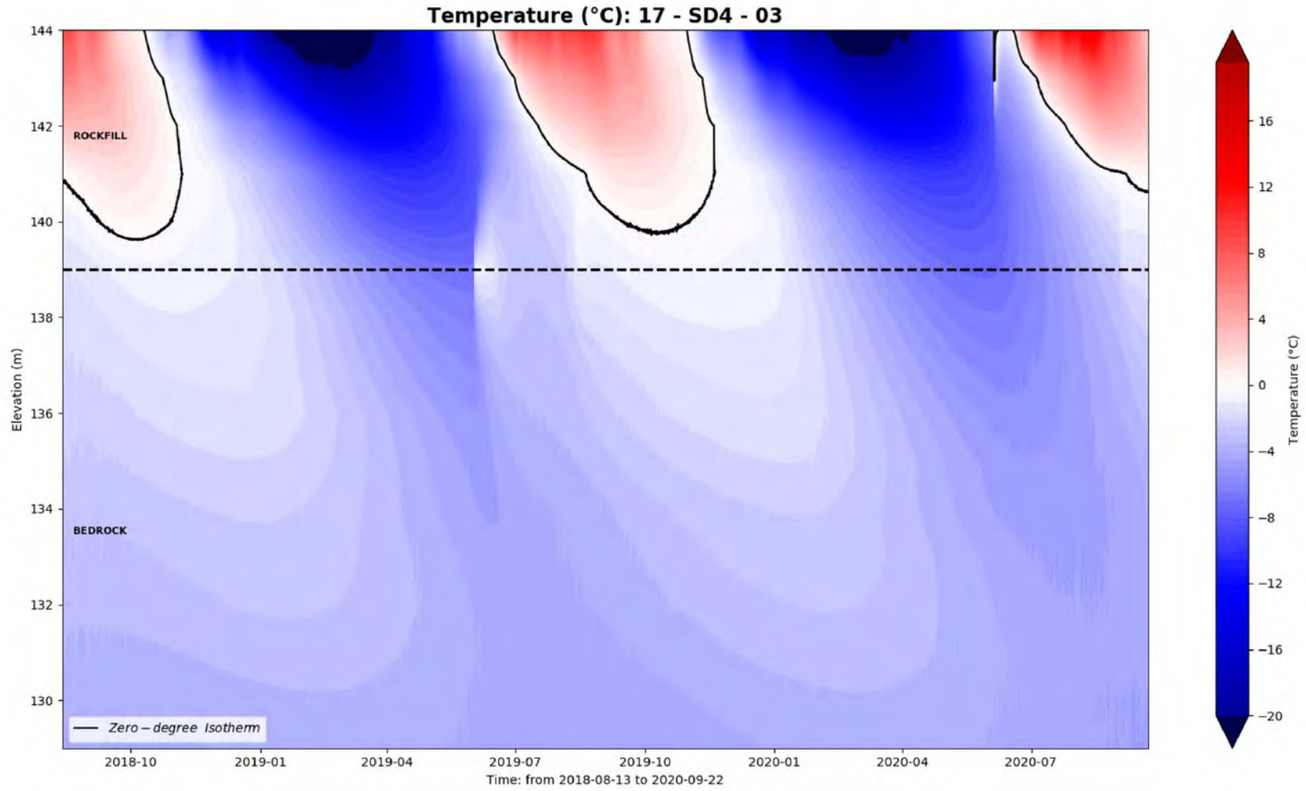


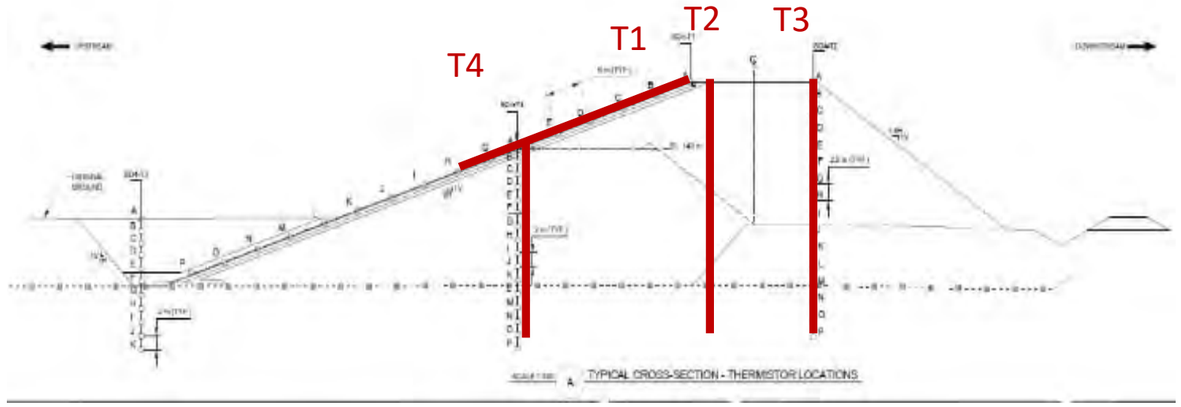


Saddle Dam 4 T3



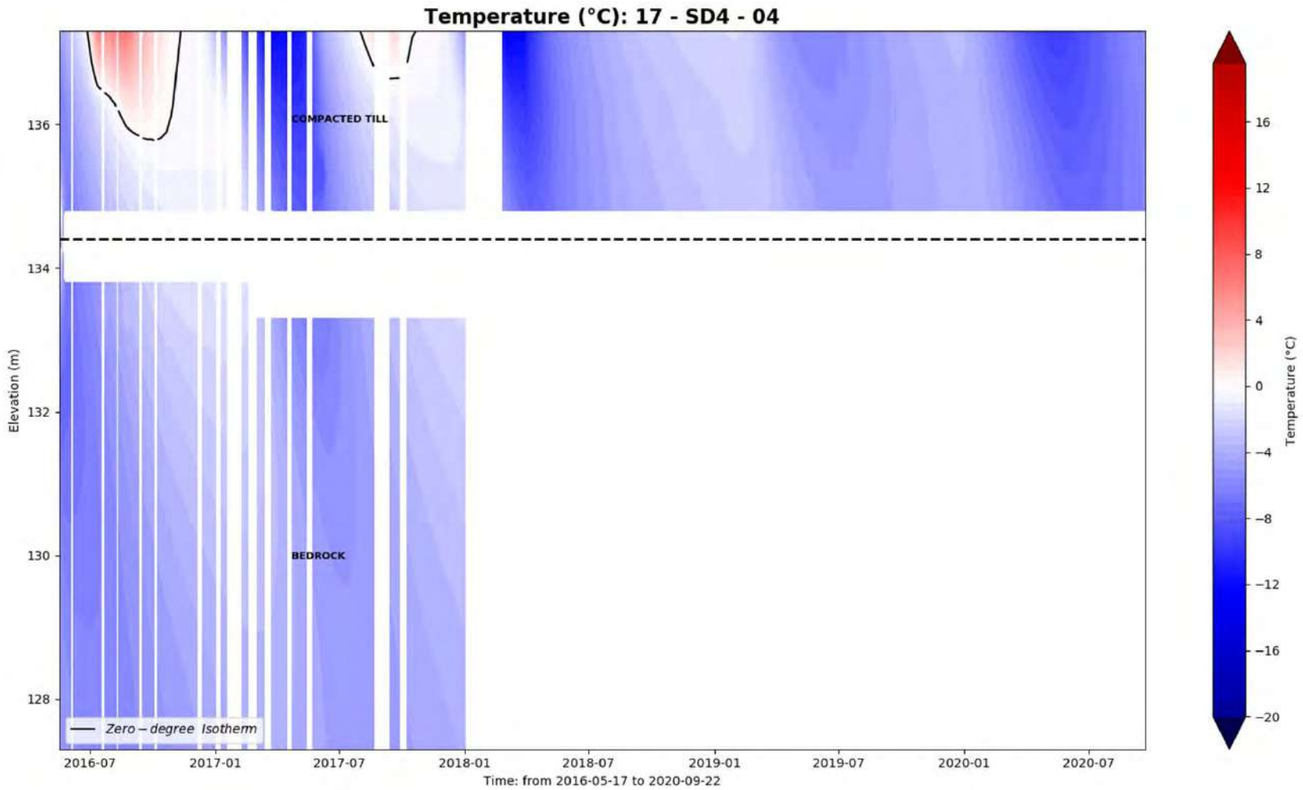


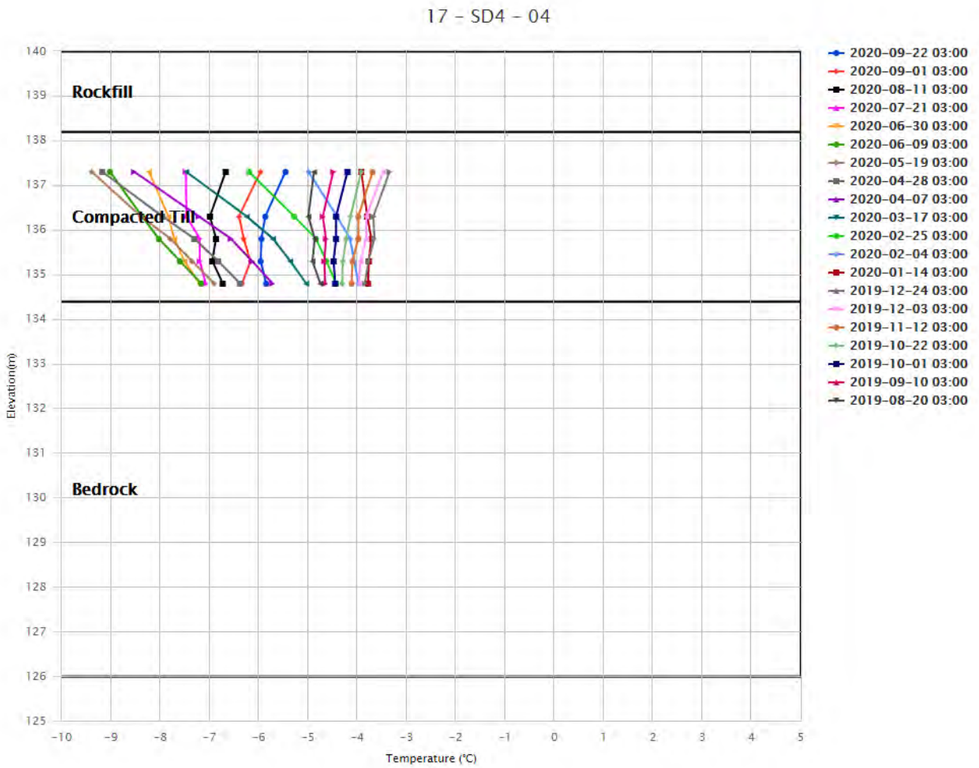


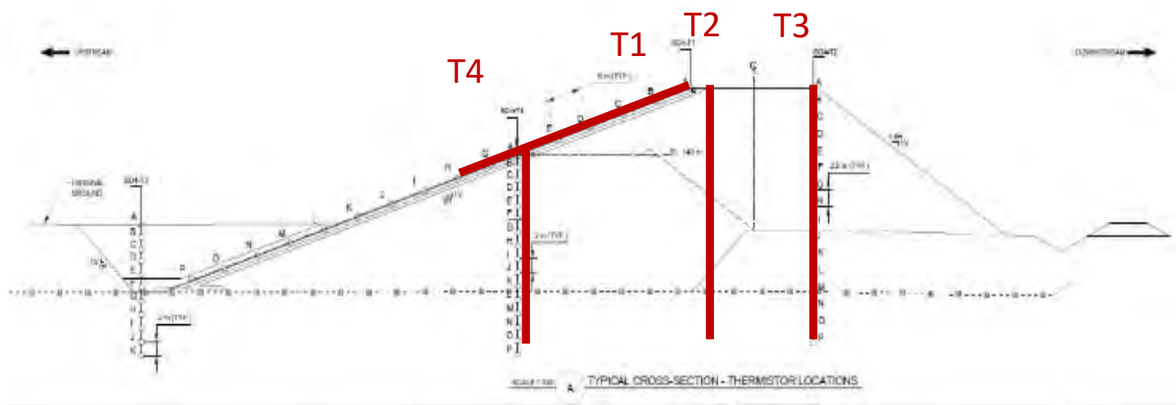


Saddle Dam 4 T4

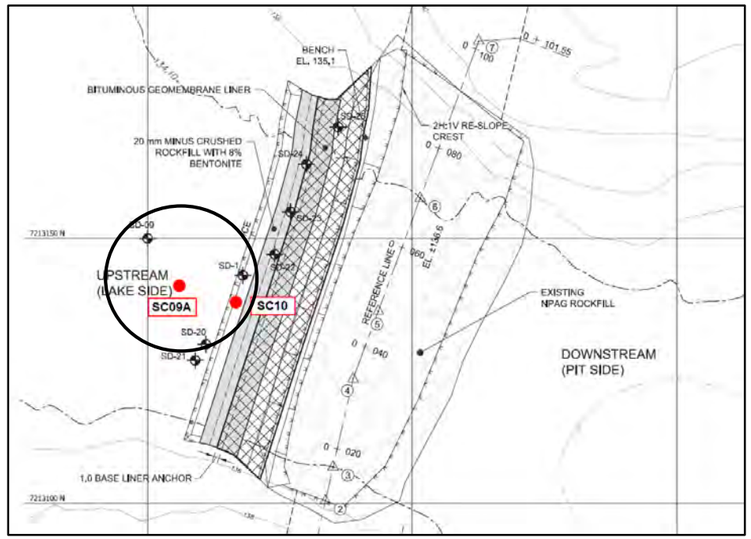


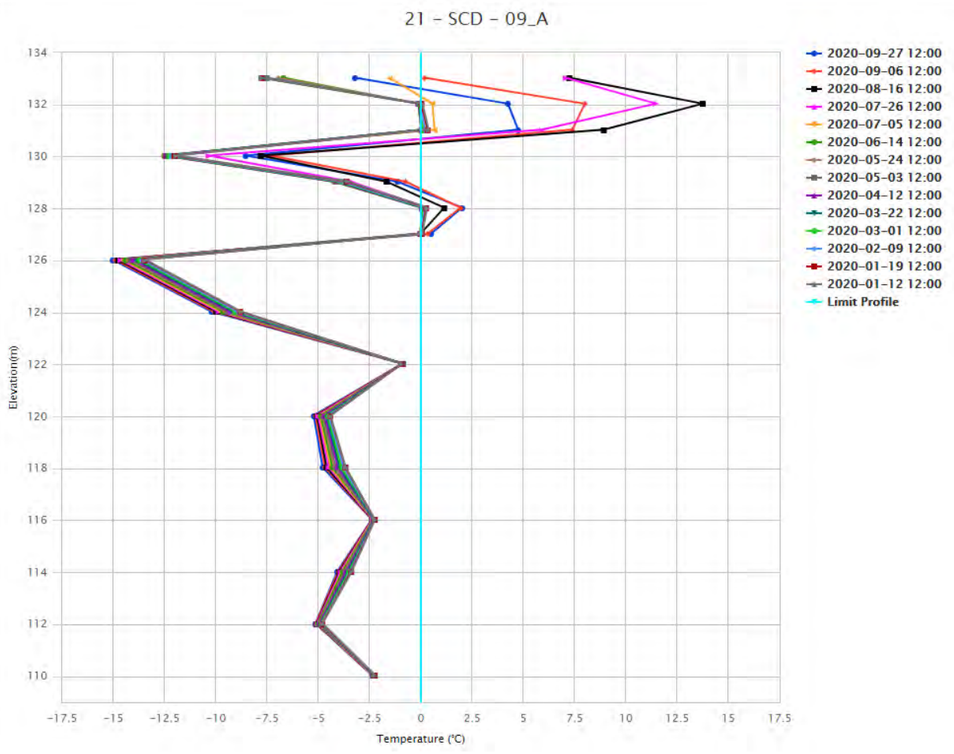


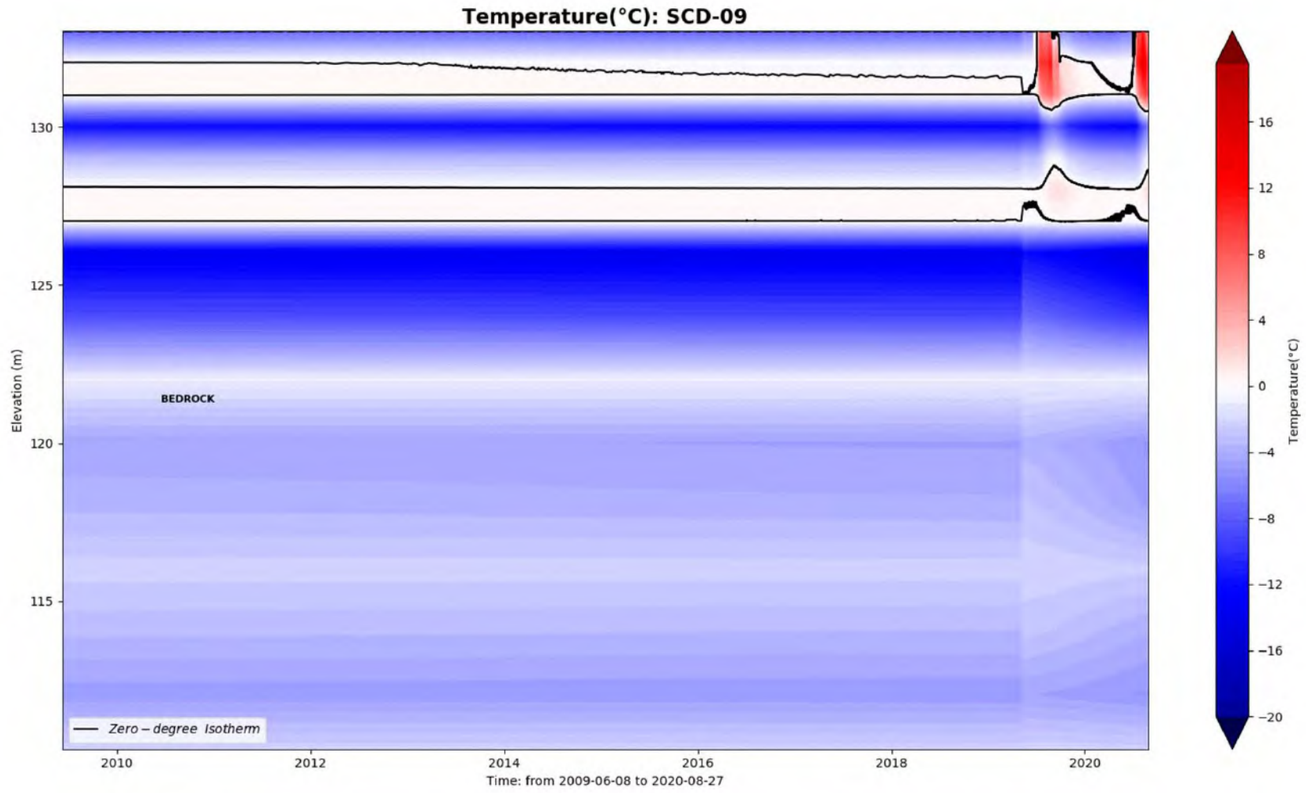


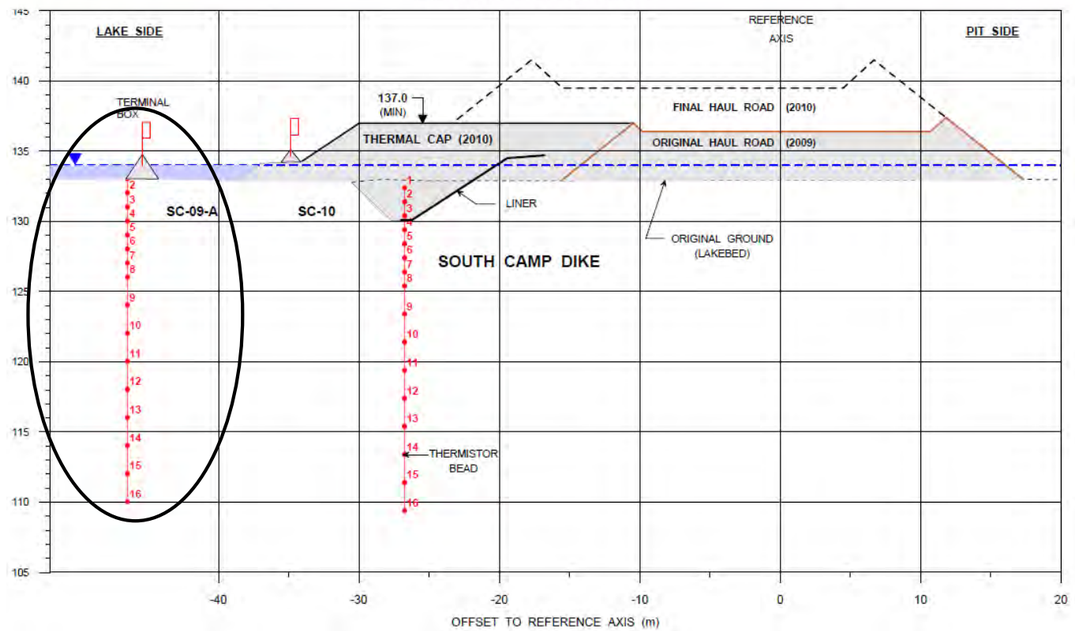


South Camp SC-09A

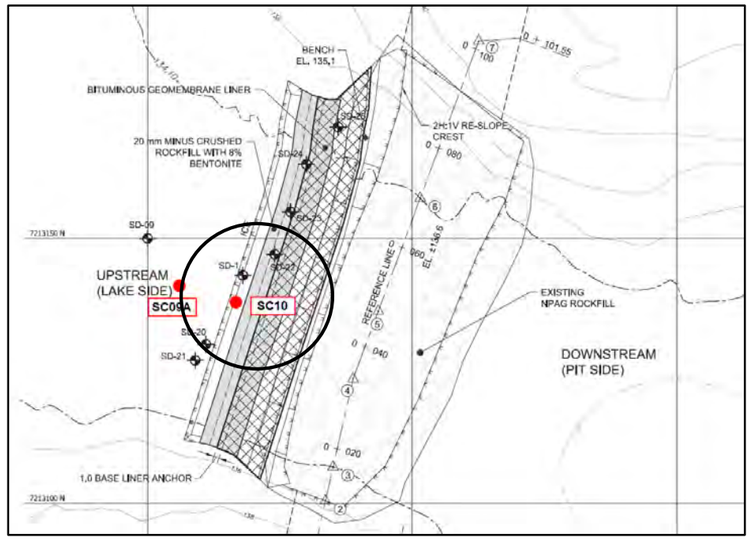


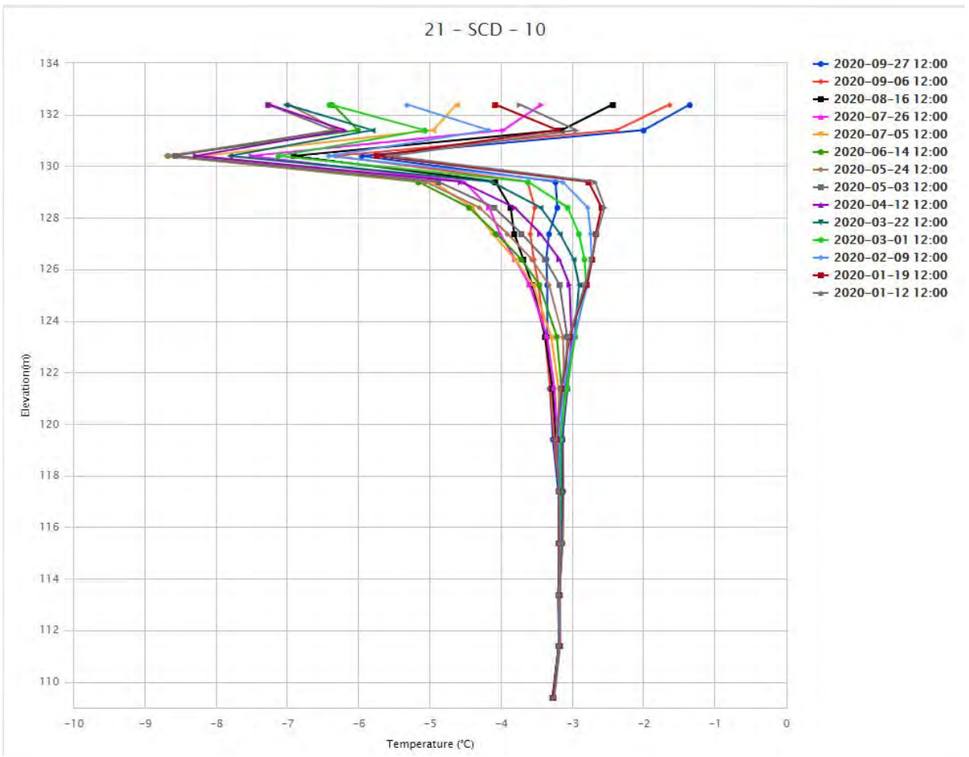


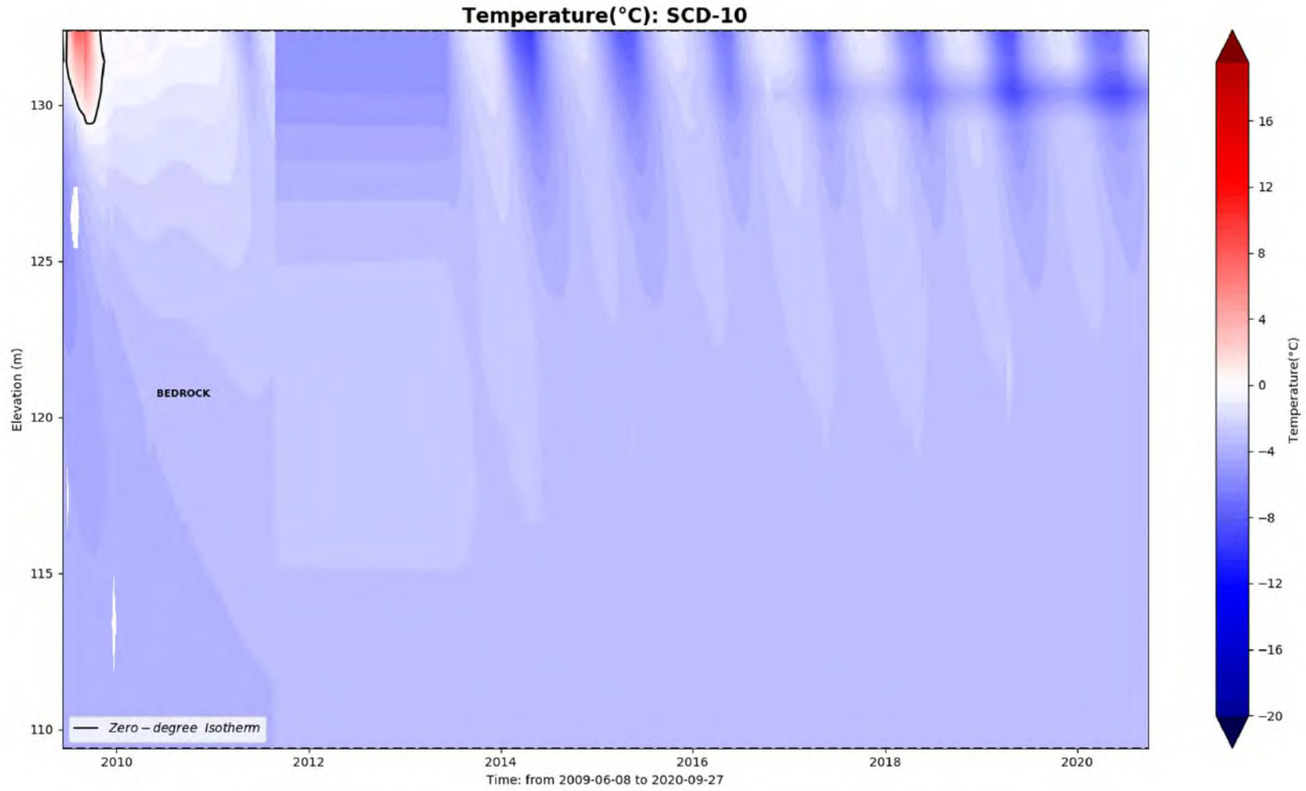


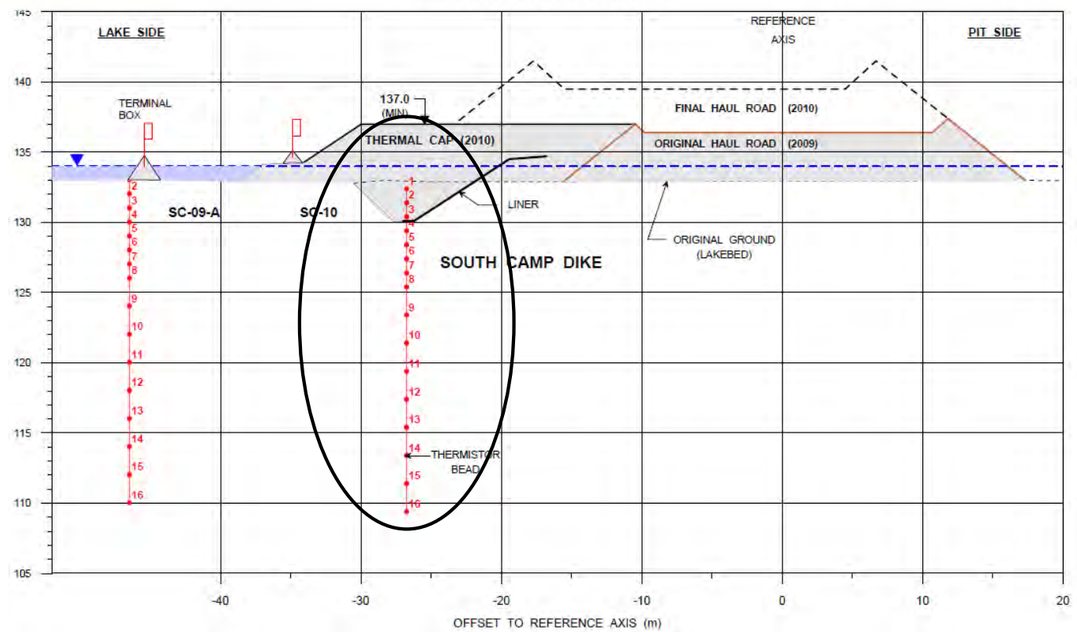


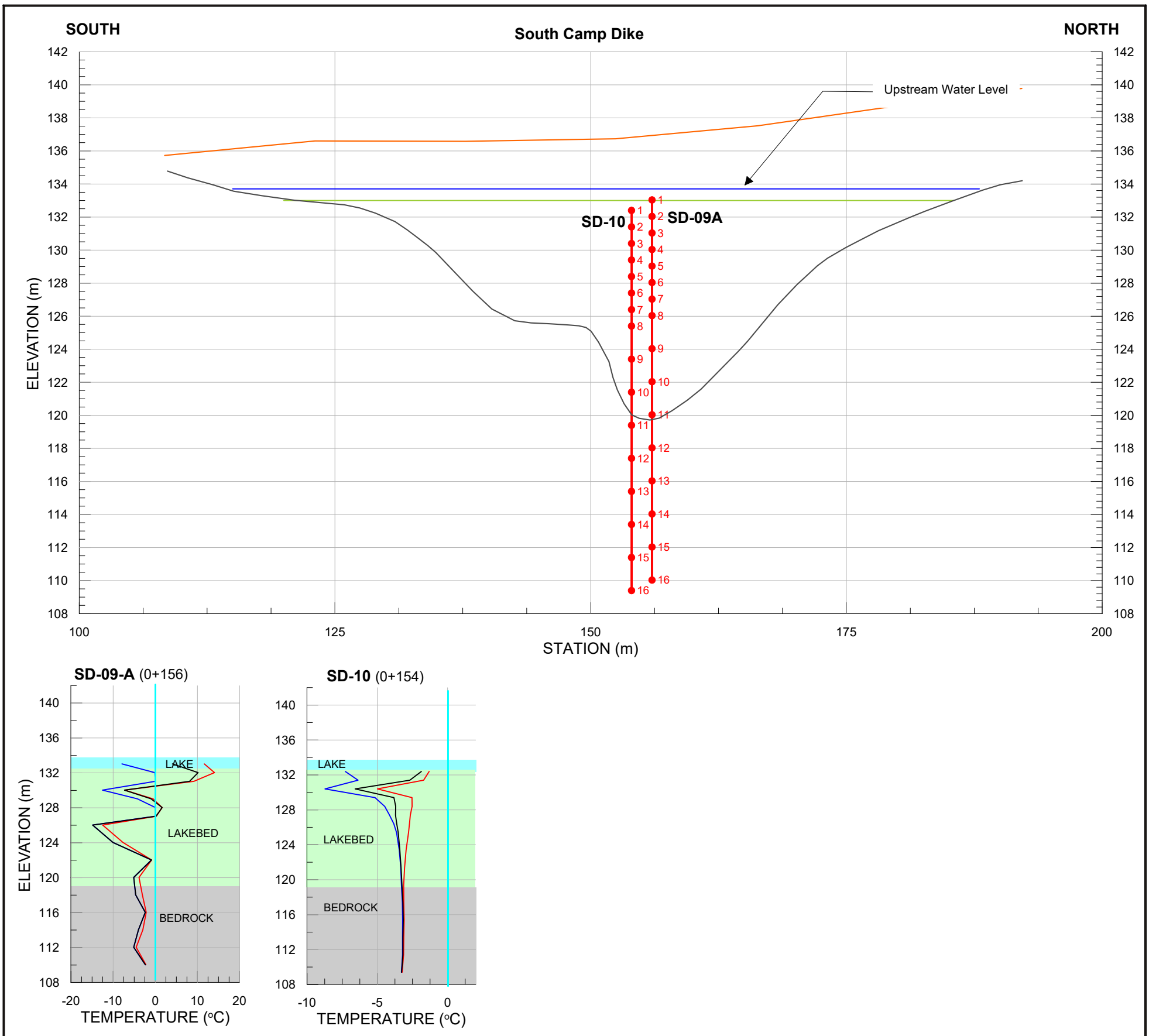
South Camp SC-10









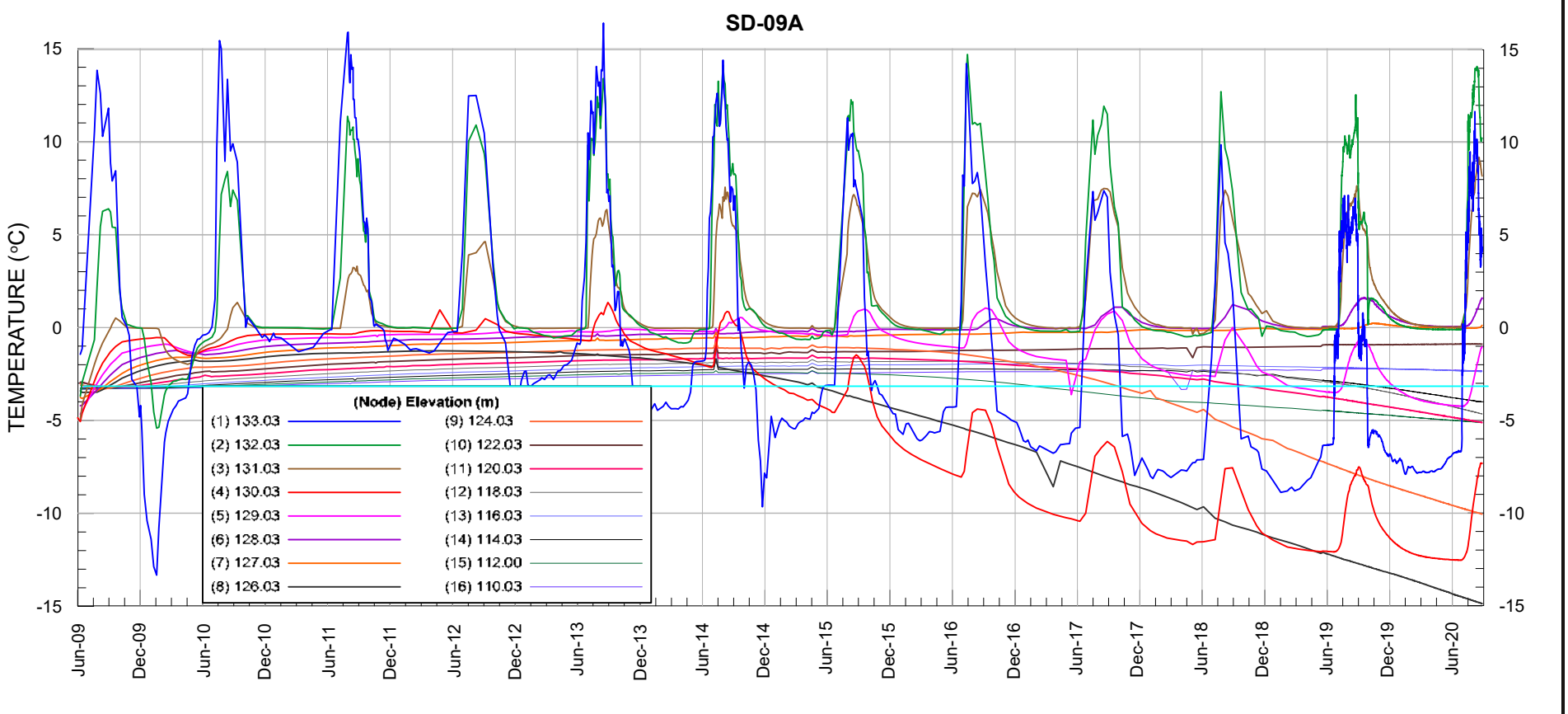


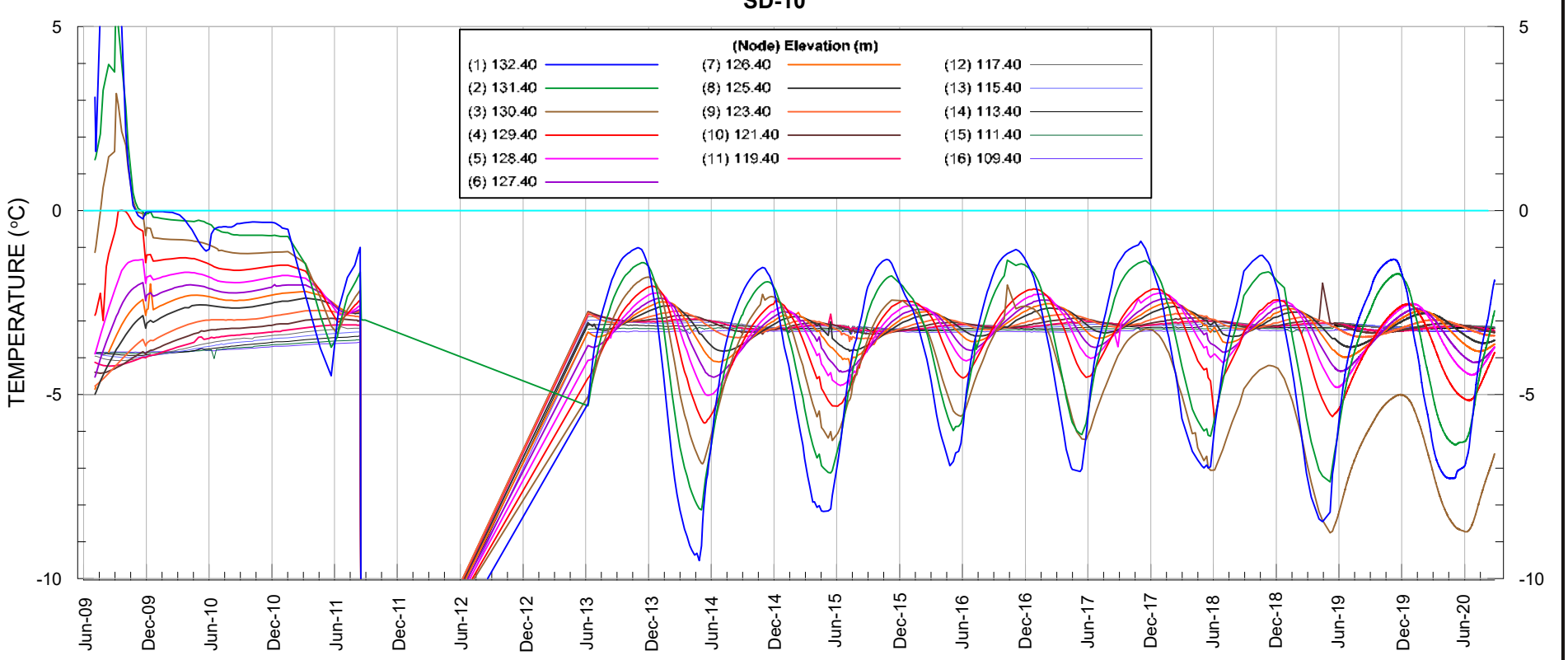
PROJECT: AGNICO EAGLE MINES LIMITED
MEADOWBANK GOLD PROJECT
NUNAVUT

TITLE: SOUTH CAMP DIKE
TEMPERATURE DATA
(Aug 1/19 to Aug 27/20)

AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.
DESIGN	TD	28AUG14	SCALE AS SHOWN REV.
CADD	TD	28AUG14	
CHECK	PG	28AUG14	FIGURE 52
REVIEW			



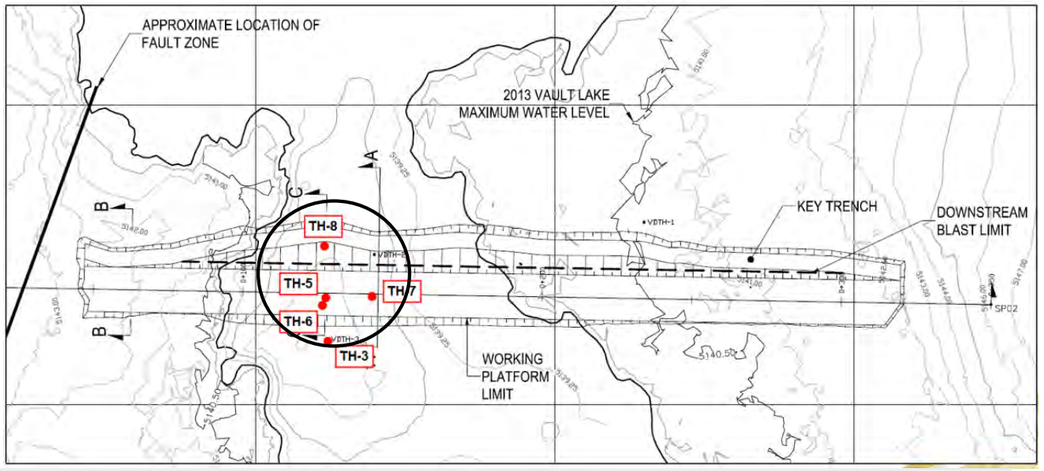


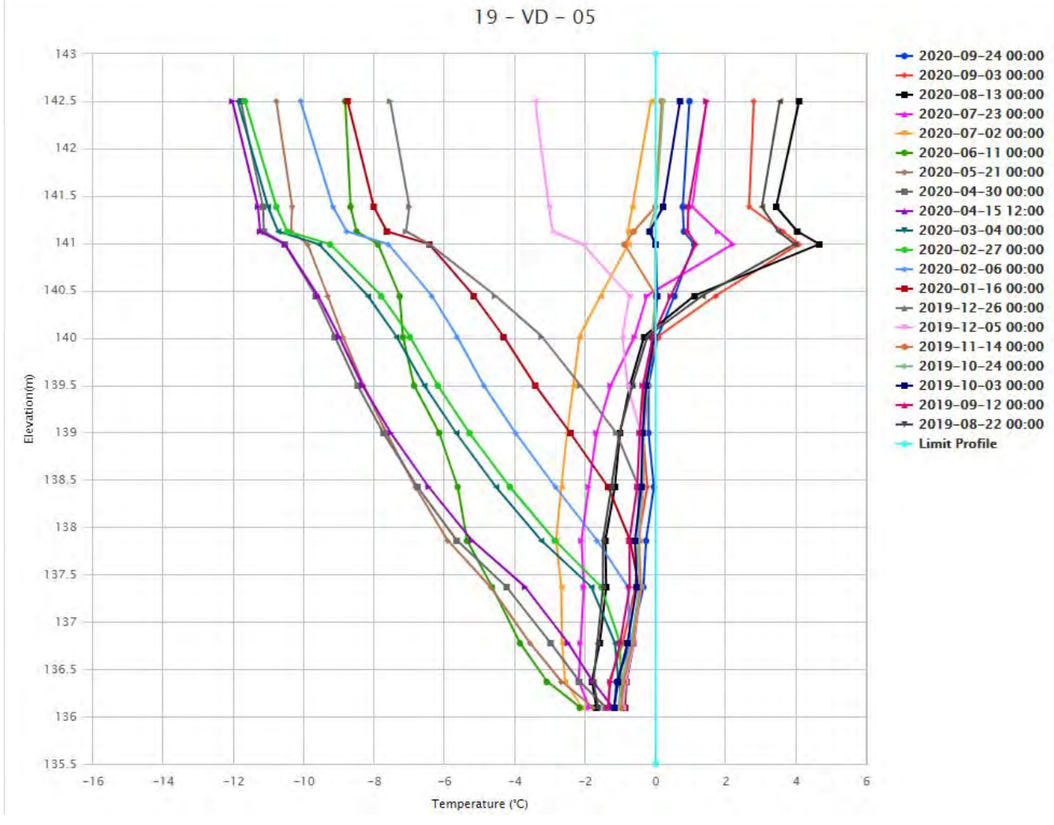
PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	SOUTH CAMP DIKE NODAL THERMAL TIMELINES (June 1/09 to Aug 27/20)

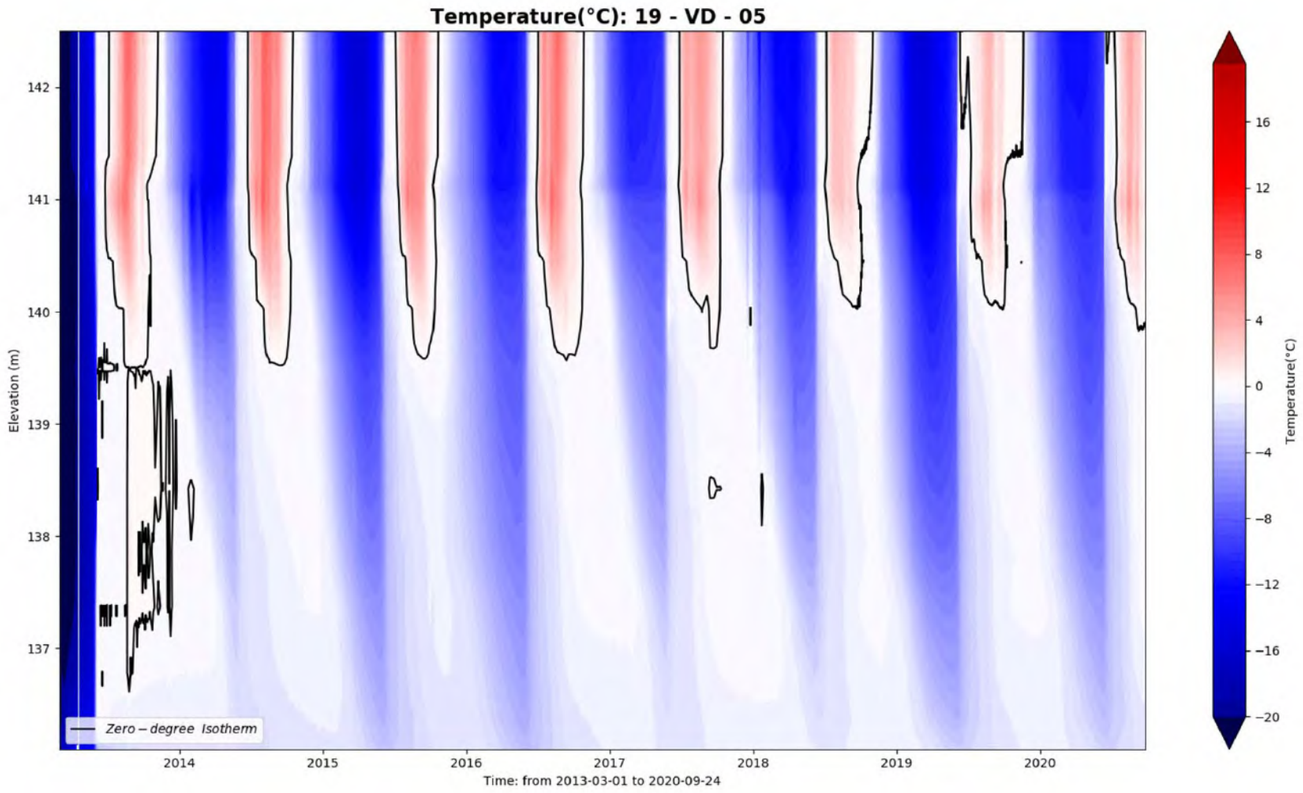
AGNICO EAGLE
MEADOWBANK

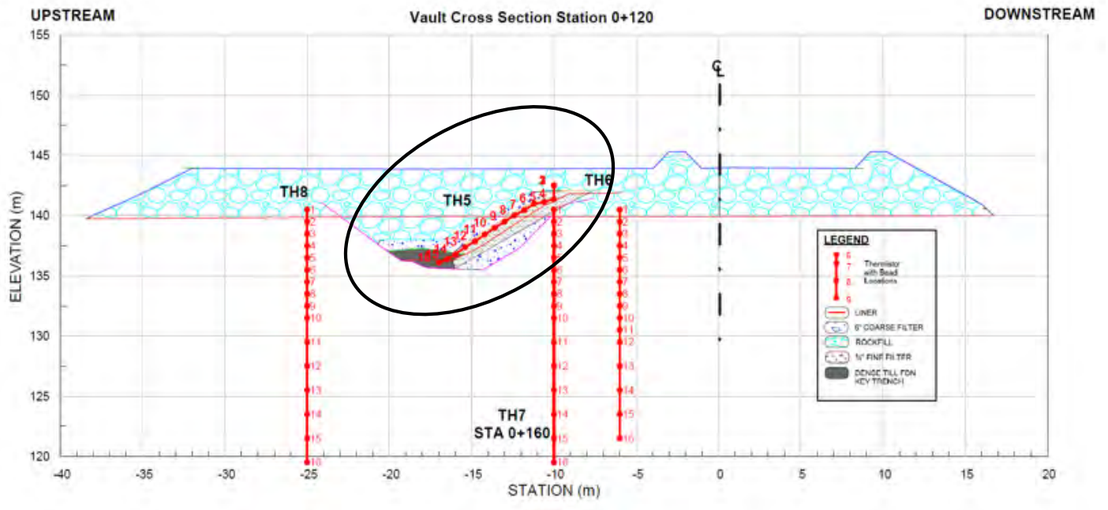
PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	FIGURE 53	
REVIEW				

Vault Dike Th5

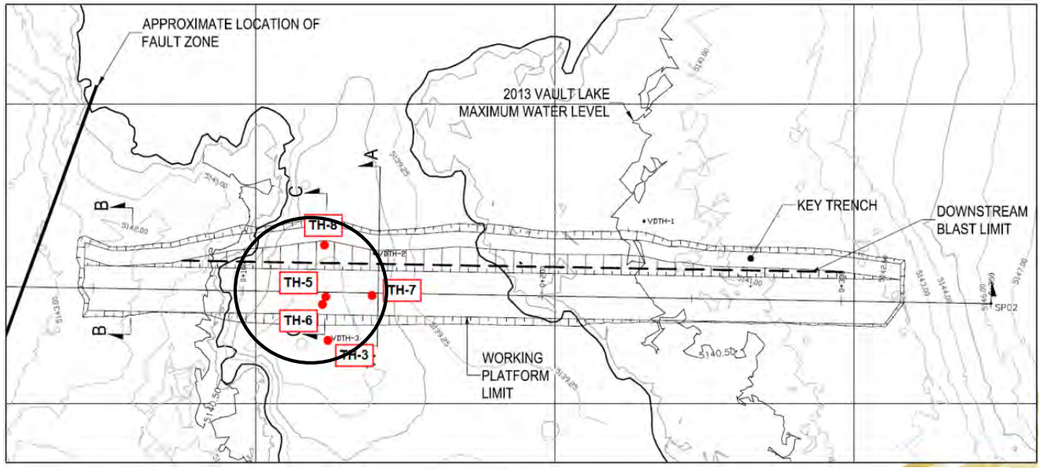




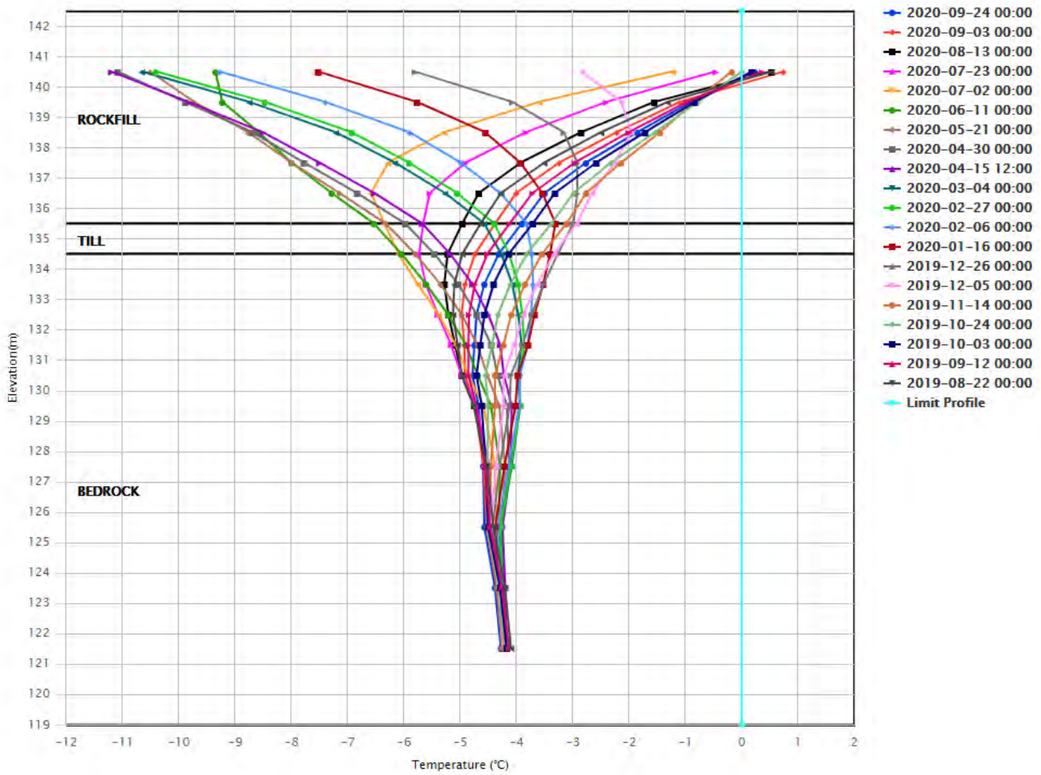


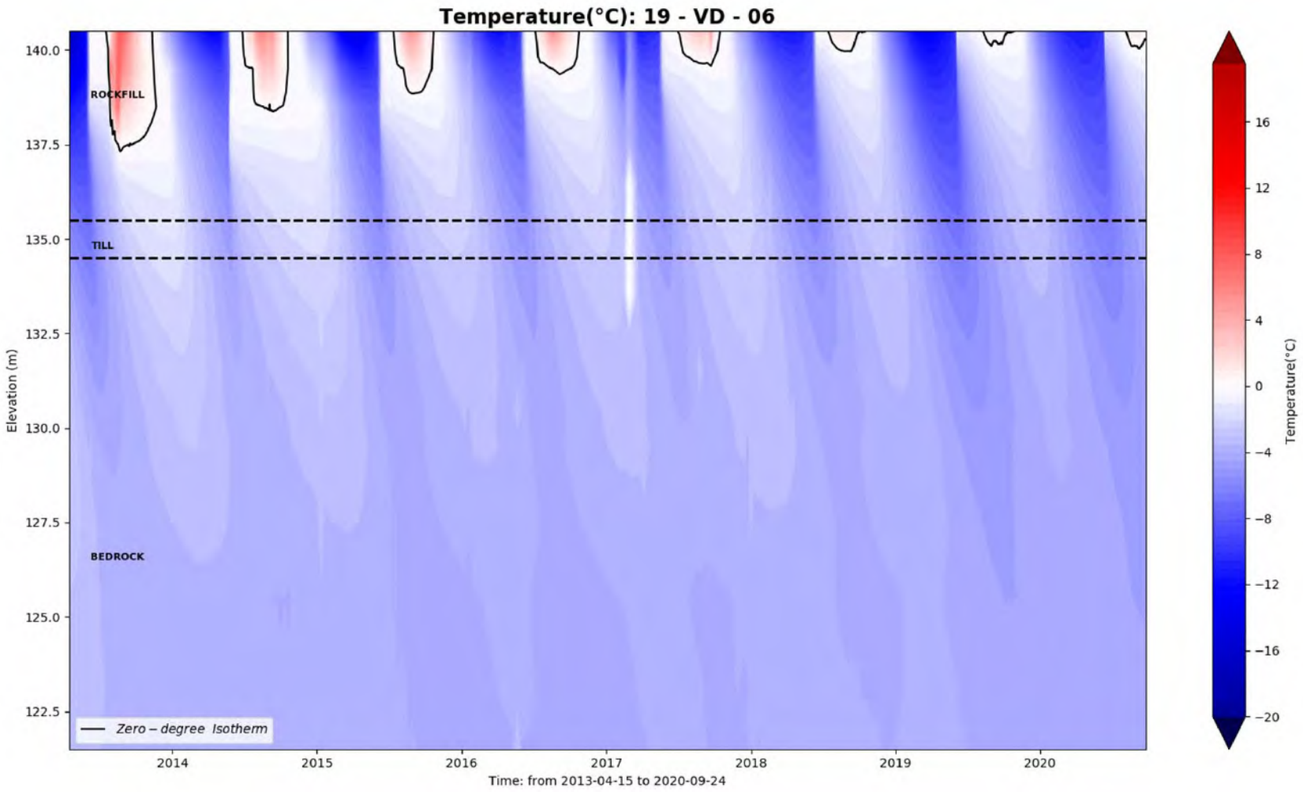


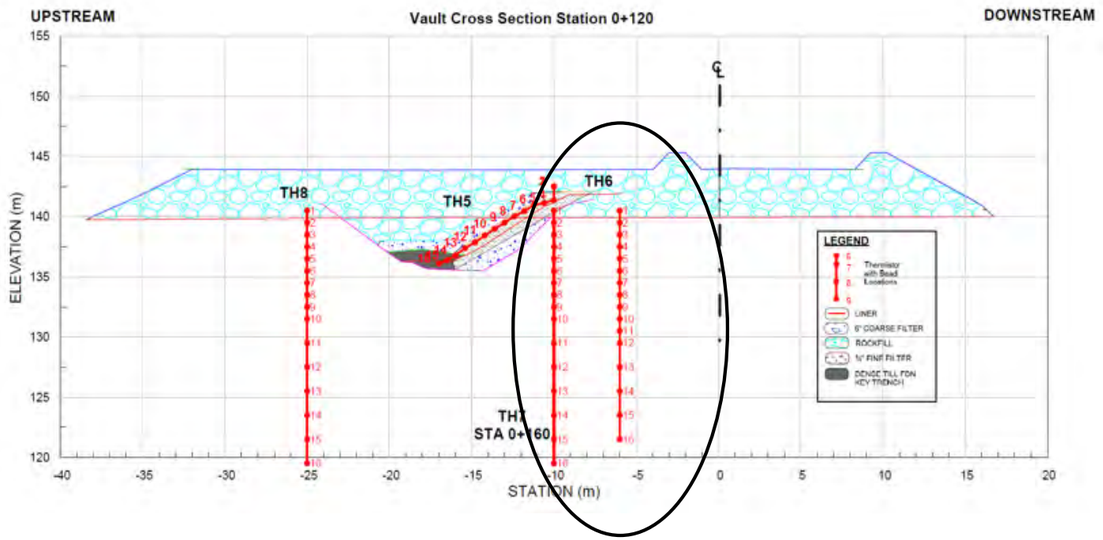
Vault Dike Th6



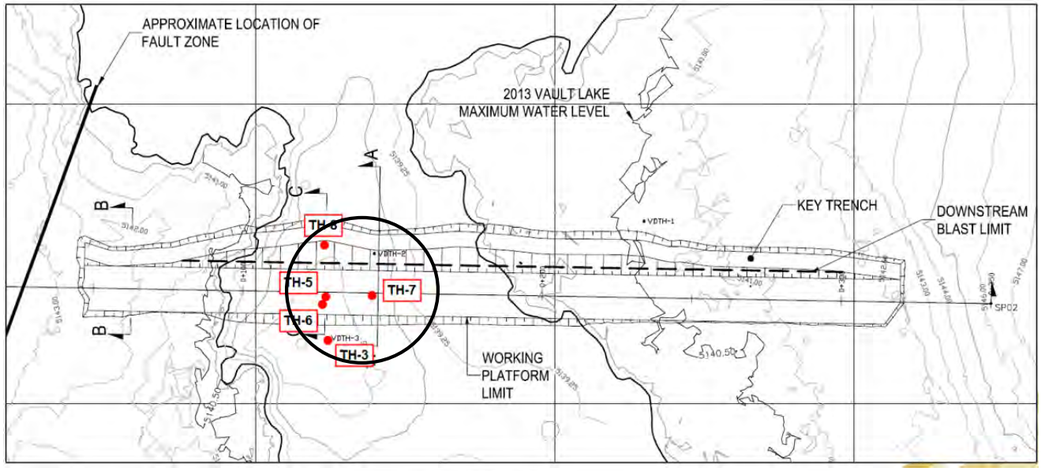
19 – VD – 06



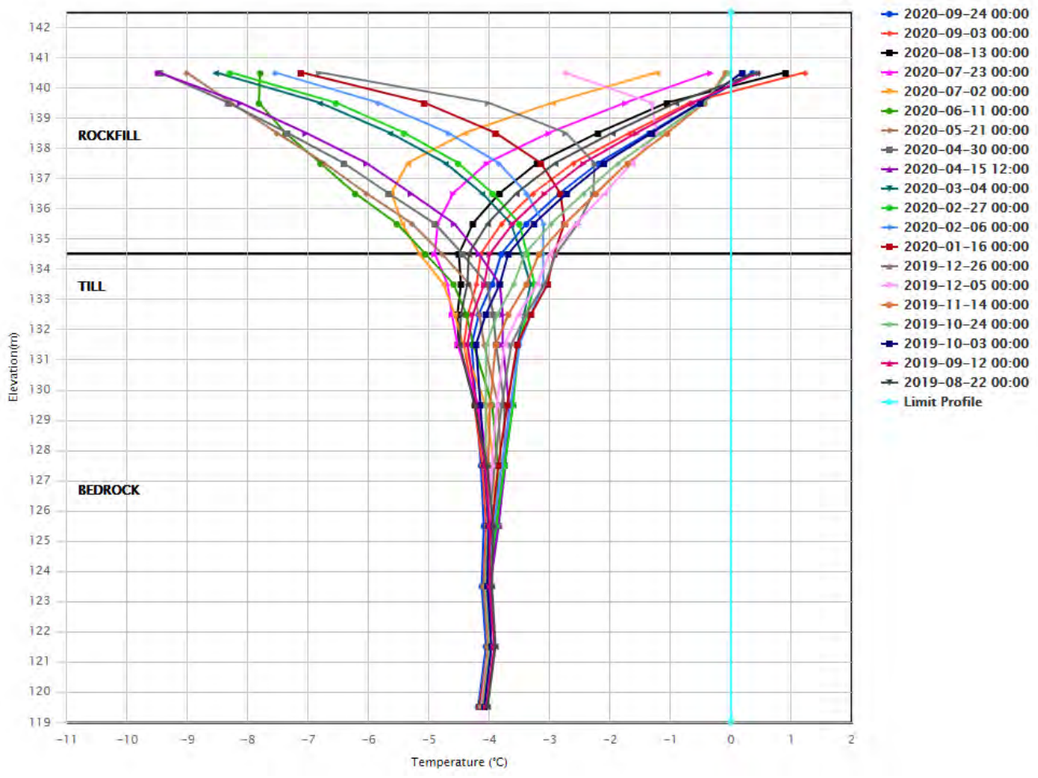


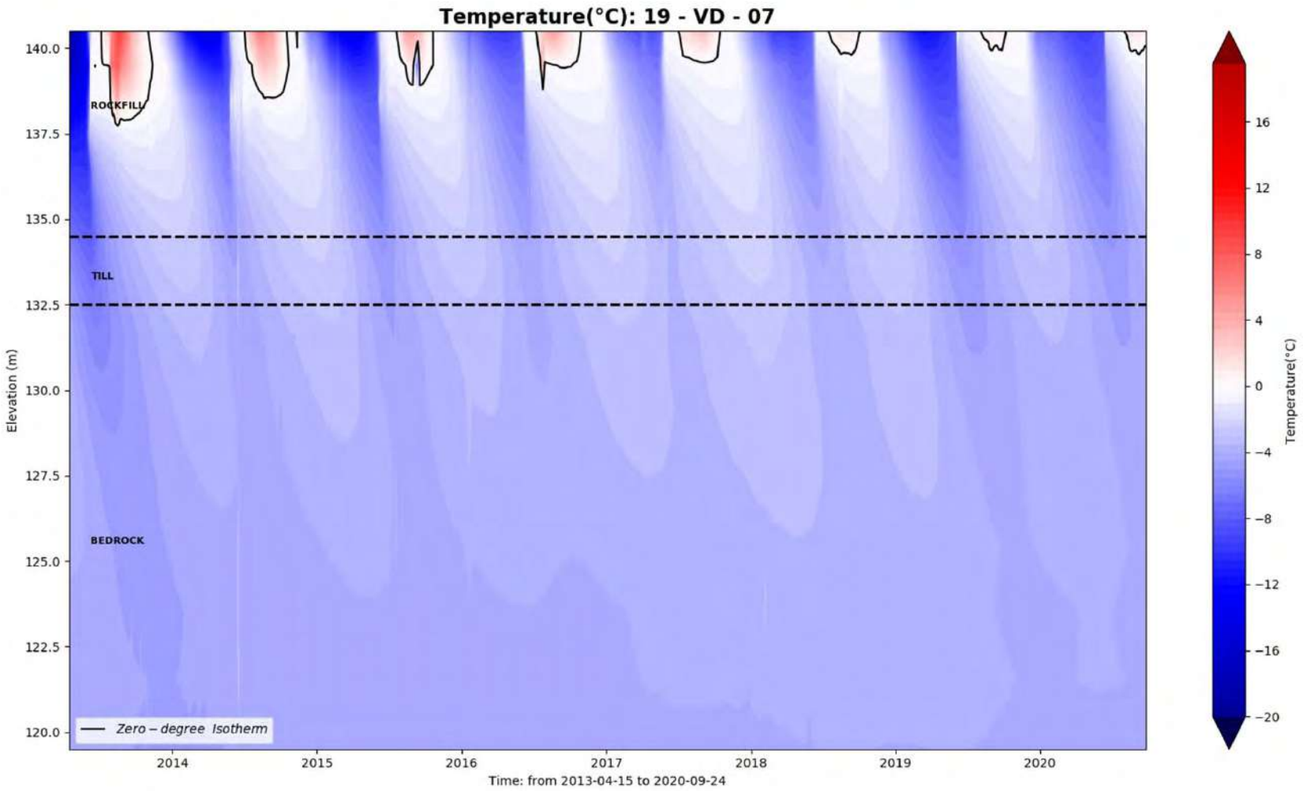


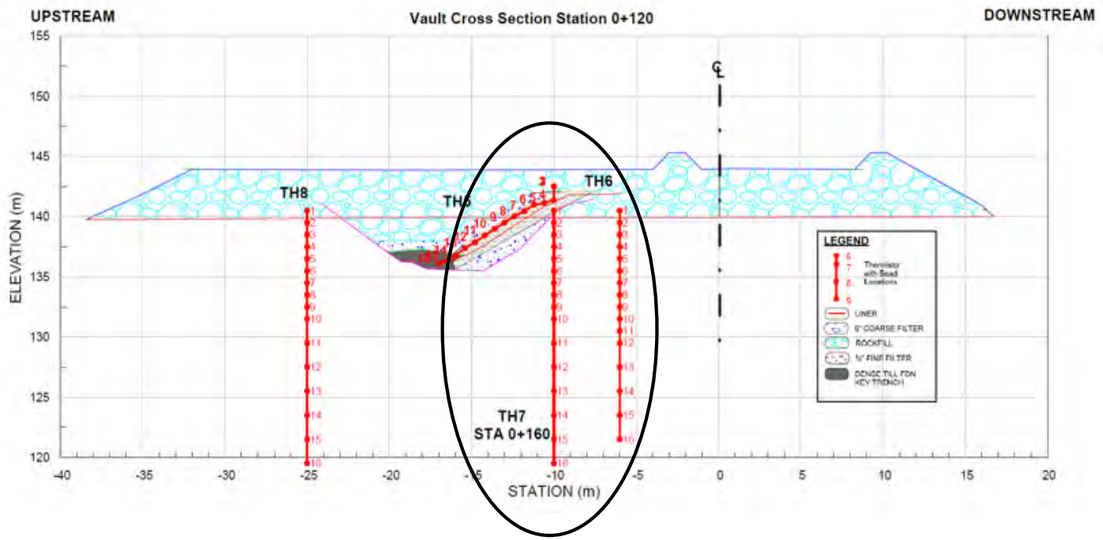
Vault Dike Th7



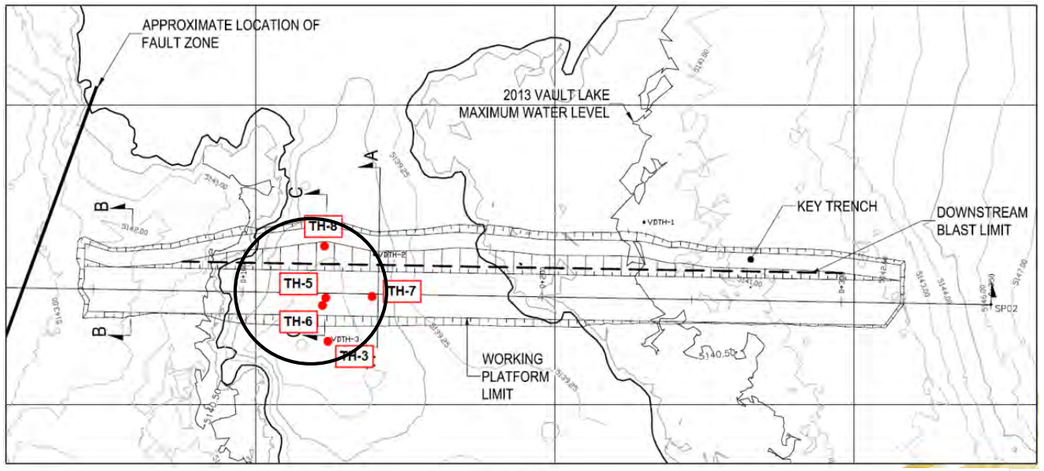
19 - VD - 07

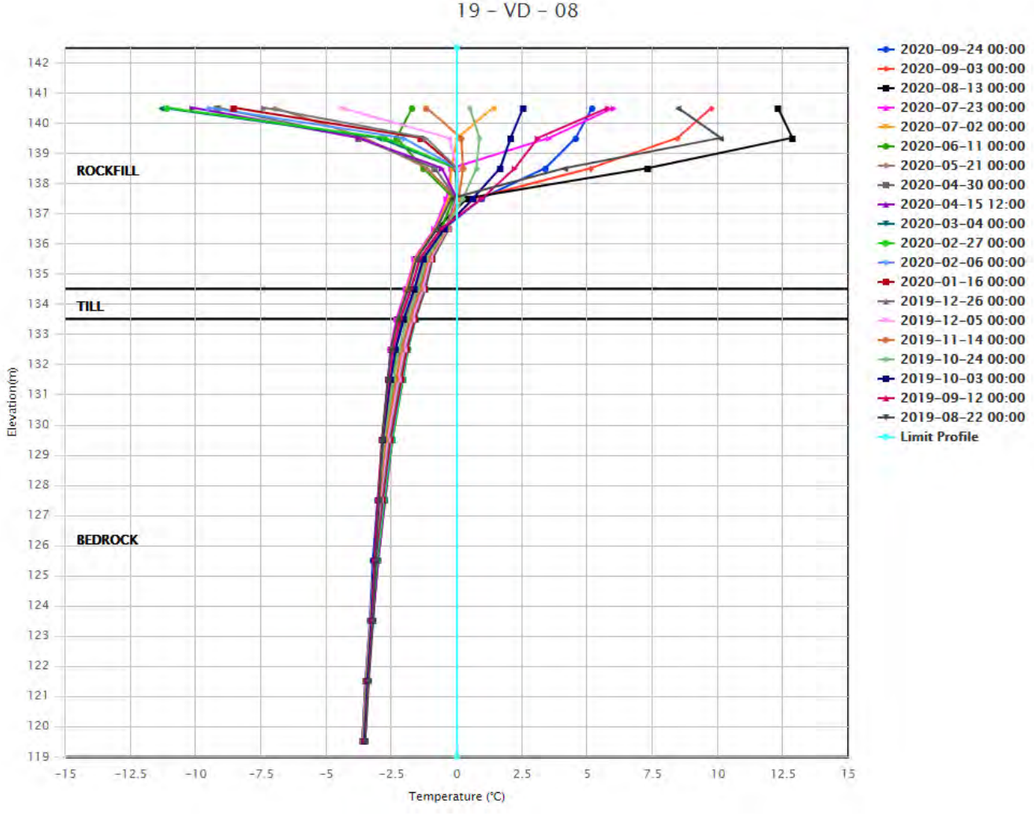


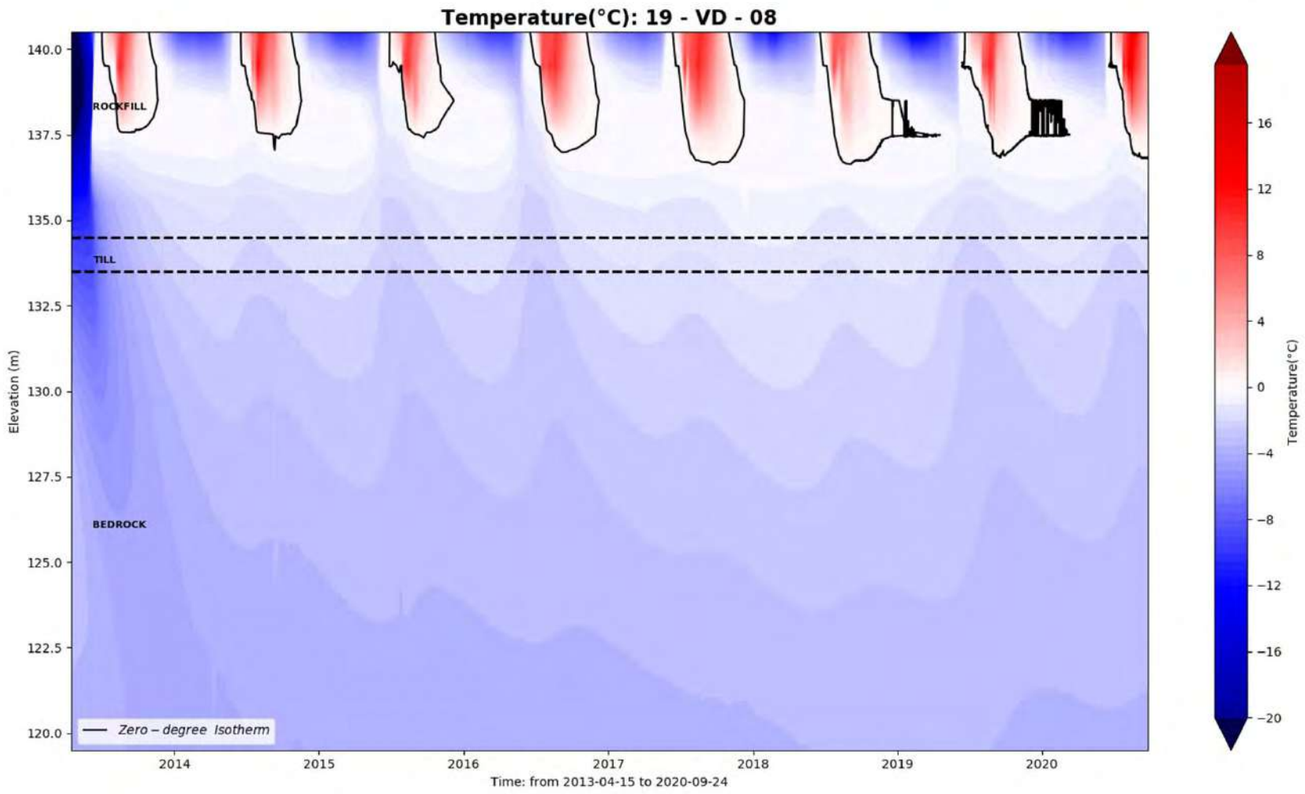


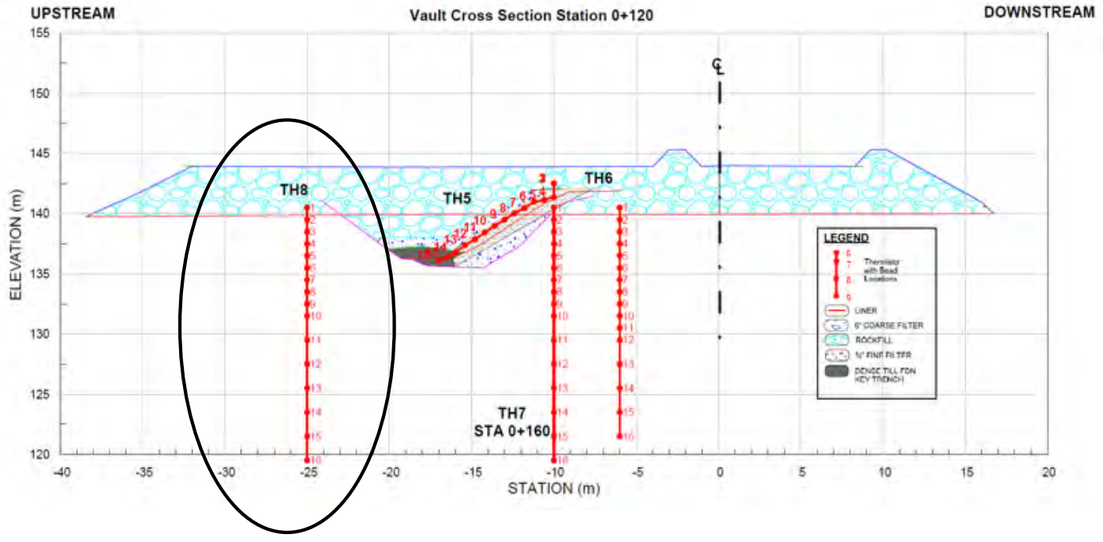


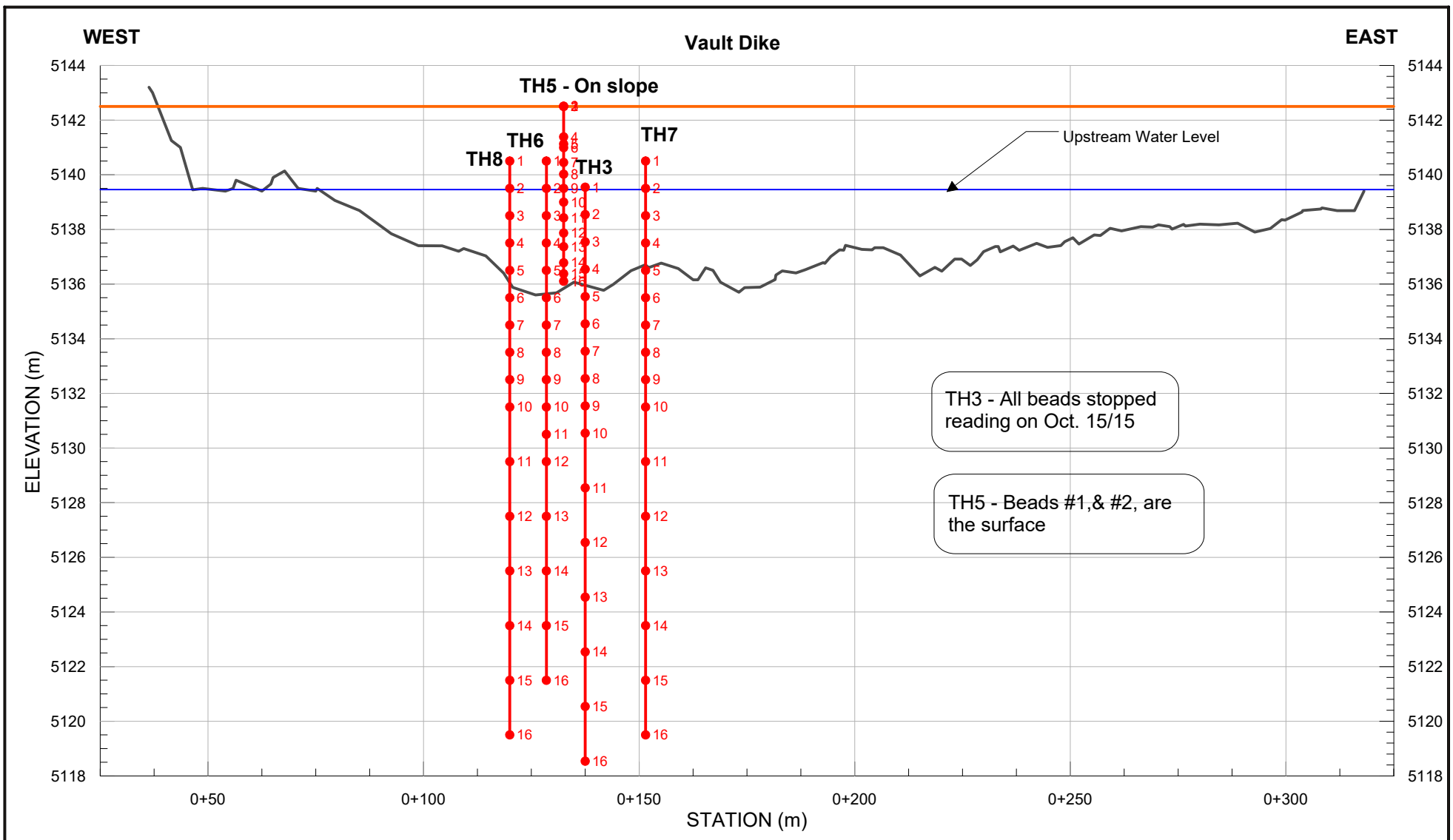
Vault Dike Th8

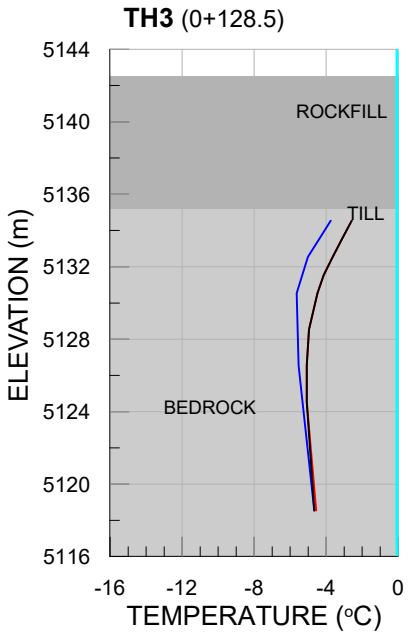


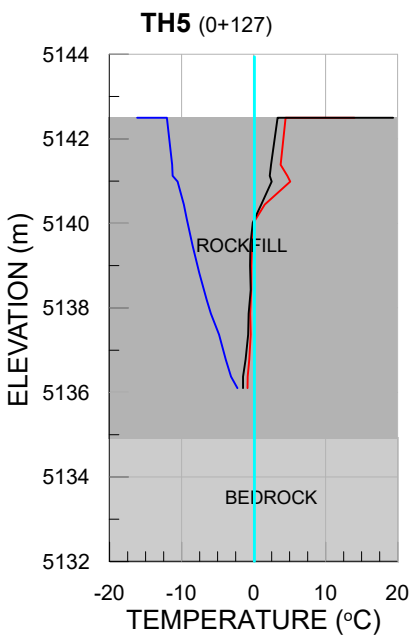


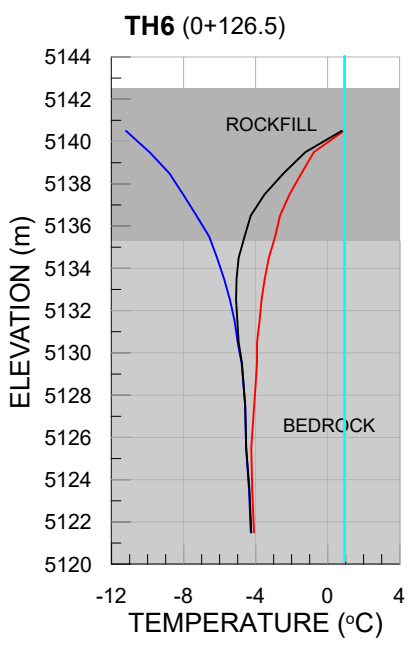


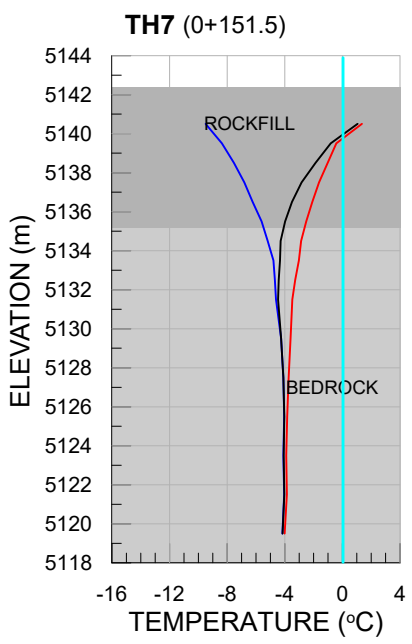


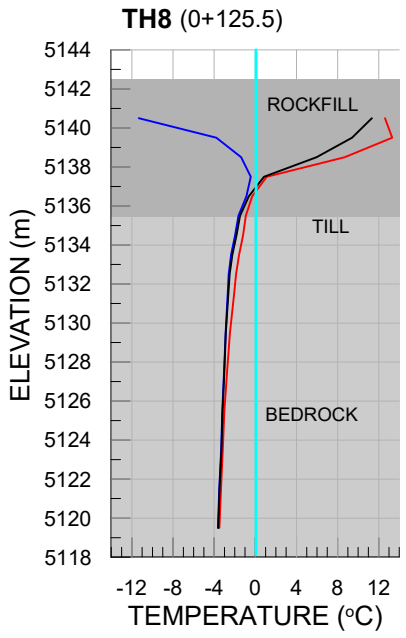


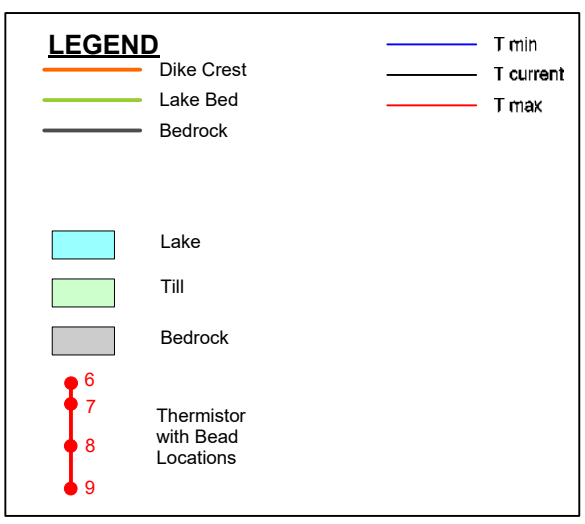












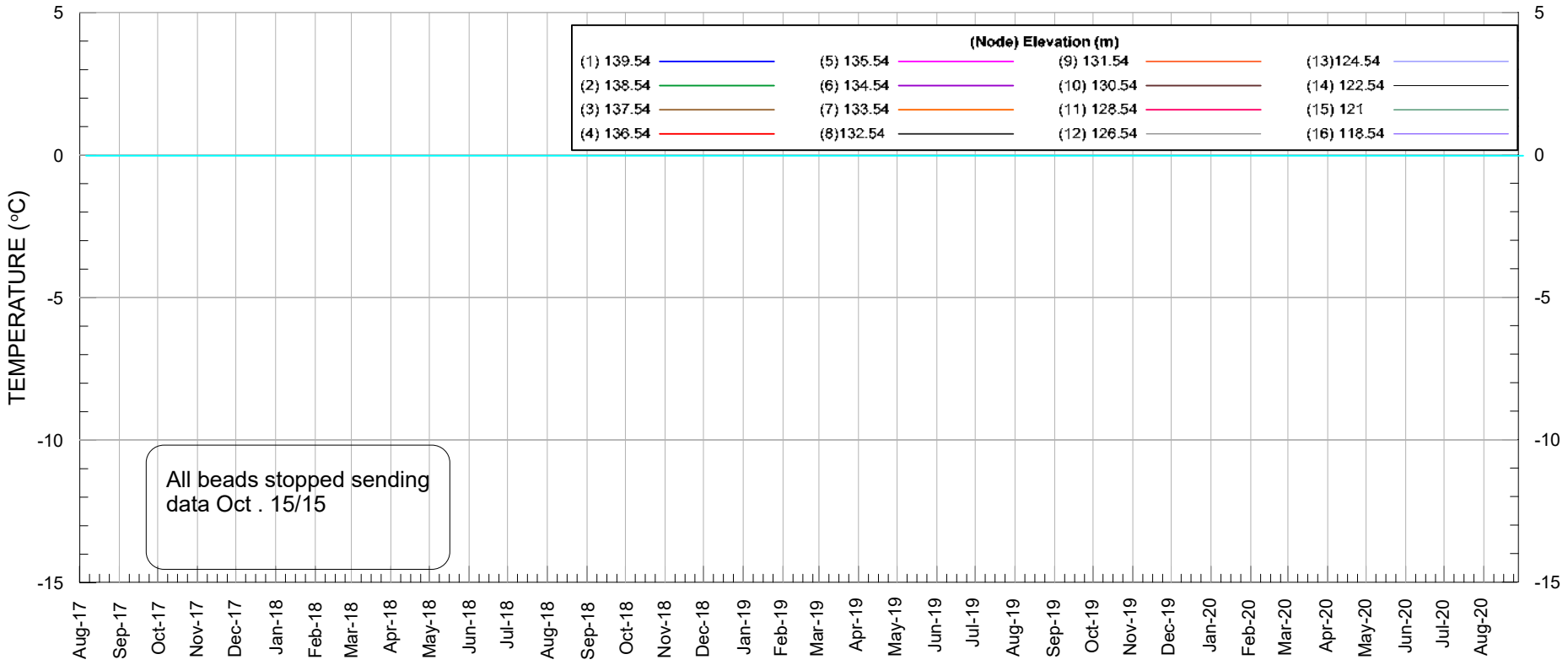
Current Temperature on August 27th,2020

PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	VAULT DIKE TEMPERATURE DATA (Aug 1/19 to Aug 27/20)

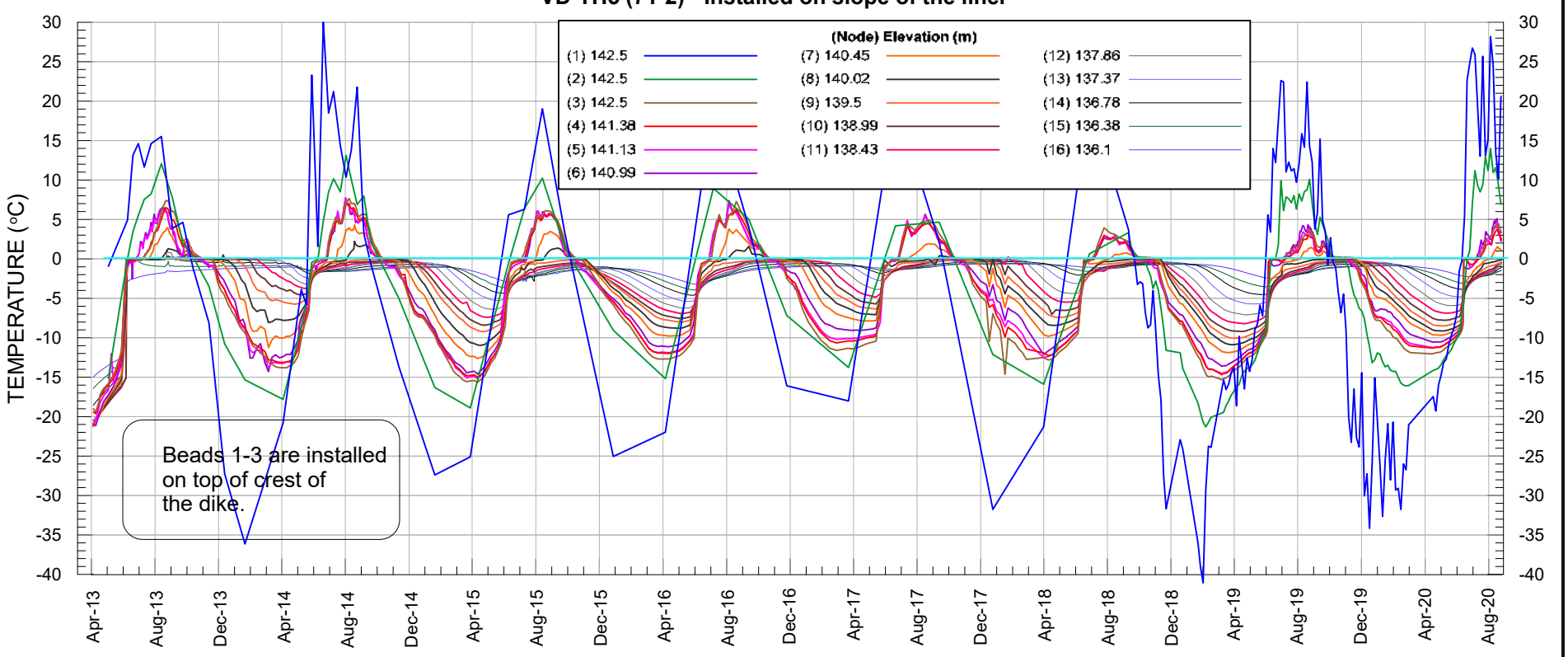
AGNICO EAGLE MEADOWBANK

PROJECT No.			PHASE No.		
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.	
CADD	TD	28AUG14	FIGURE 54		
CHECK	PG	28AUG14			
REVIEW					

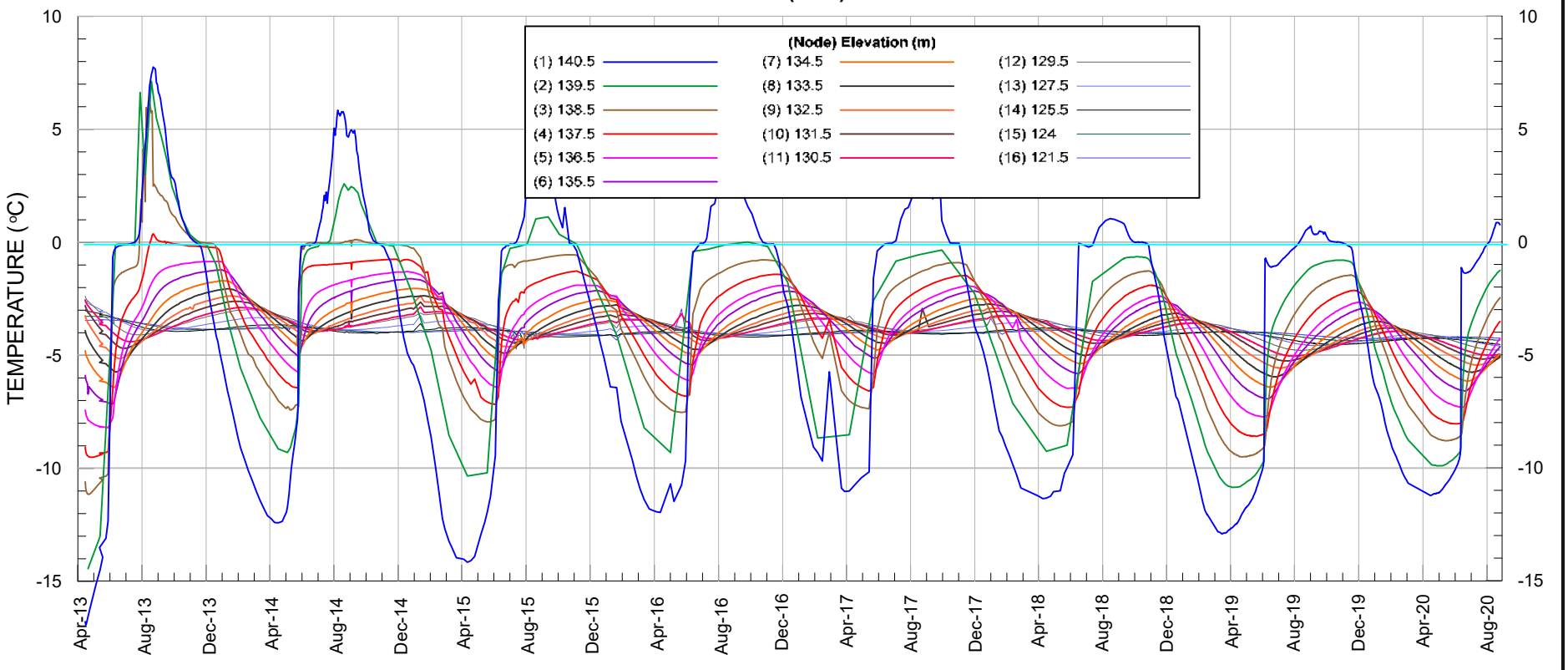
VD-TH3 (71-1)



VD-TH5 (71-2) - Installed on slope of the liner



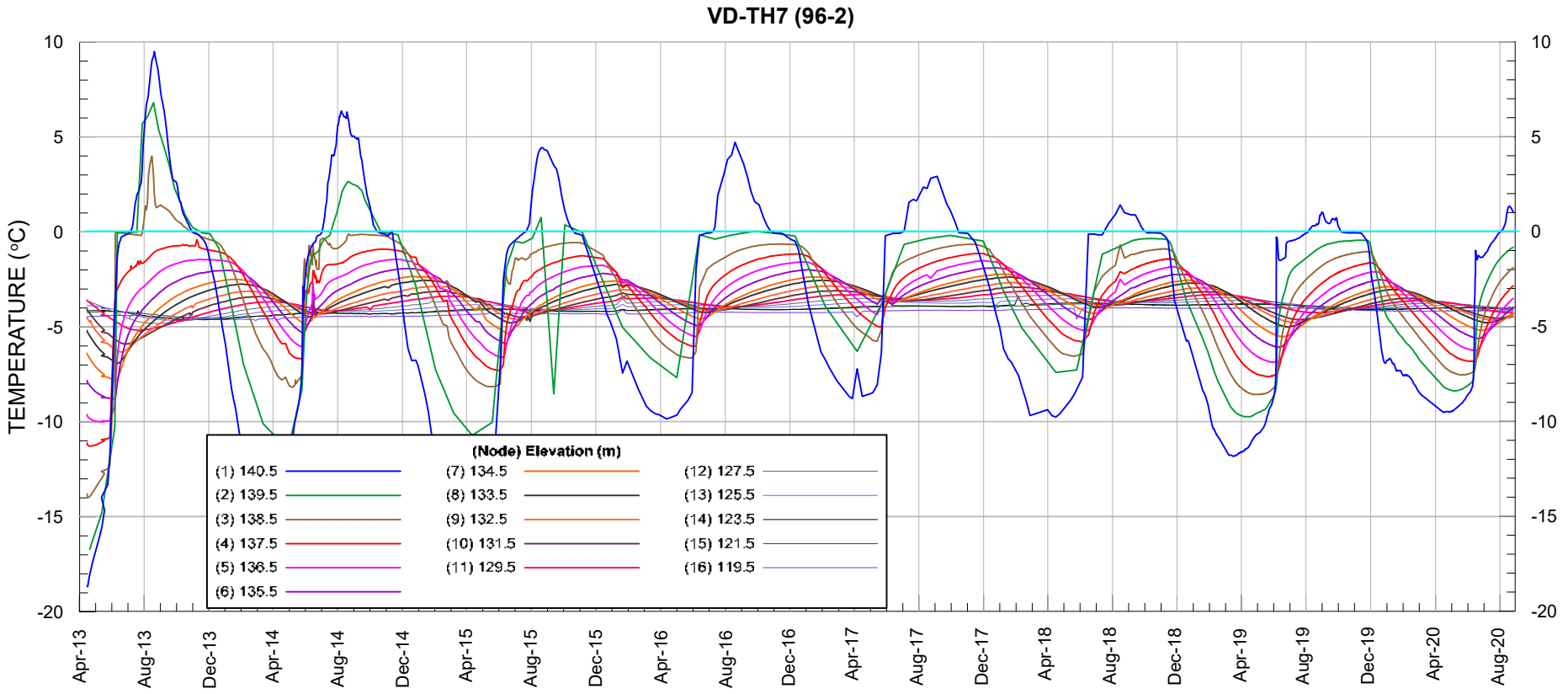
VD-TH6 (94-2)

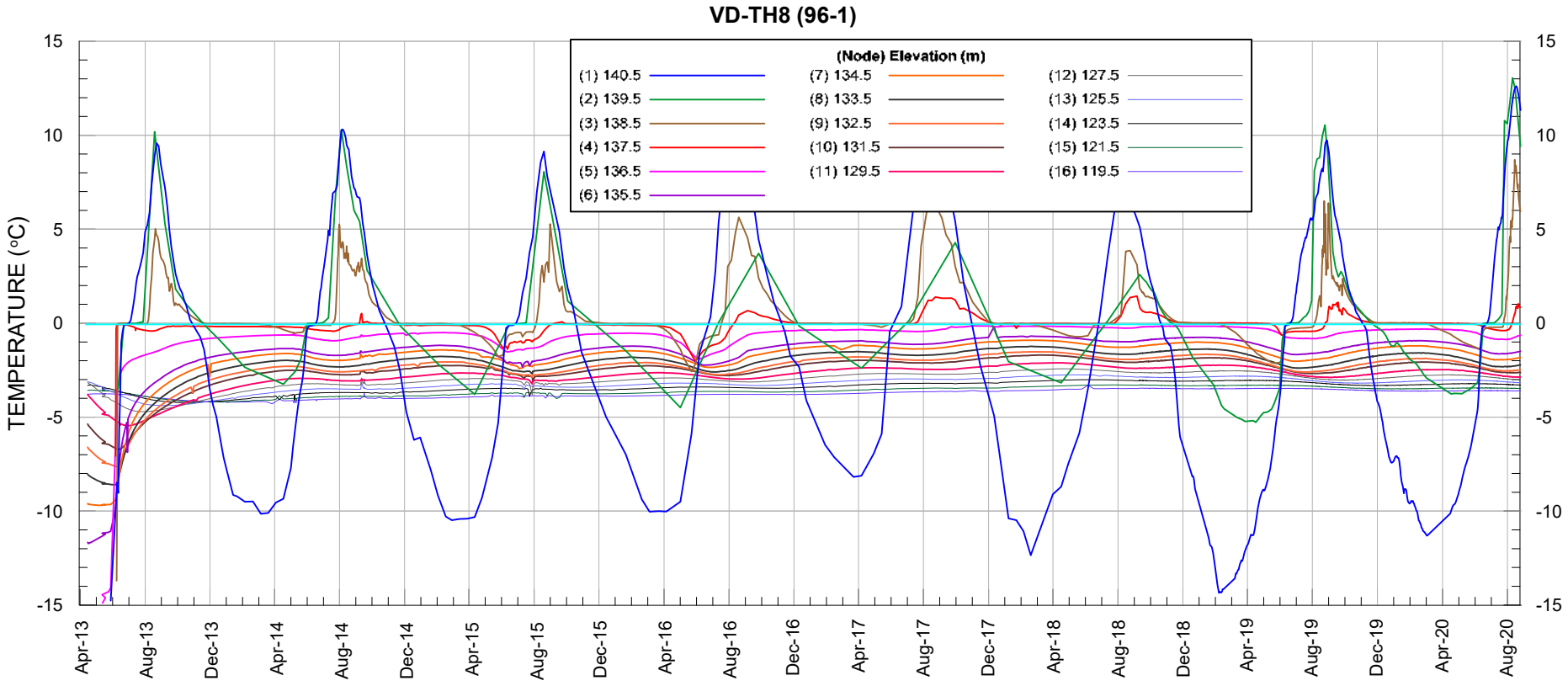


PROJECT	**AGNICO EAGLE MINES LIMITED** **MEADOWBANK GOLD PROJECT** **NUNAVUT**
TITLE	**VAULT DIKE** **NODAL THERMAL TIMELINES** **(Apr 1/13 to Aug 27/20)**

AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14		
CHECK	PG	28AUG14	**FIGURE 55**	
REVIEW				



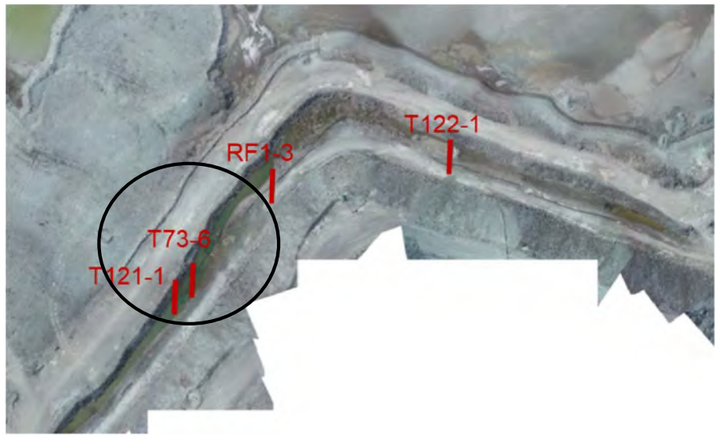


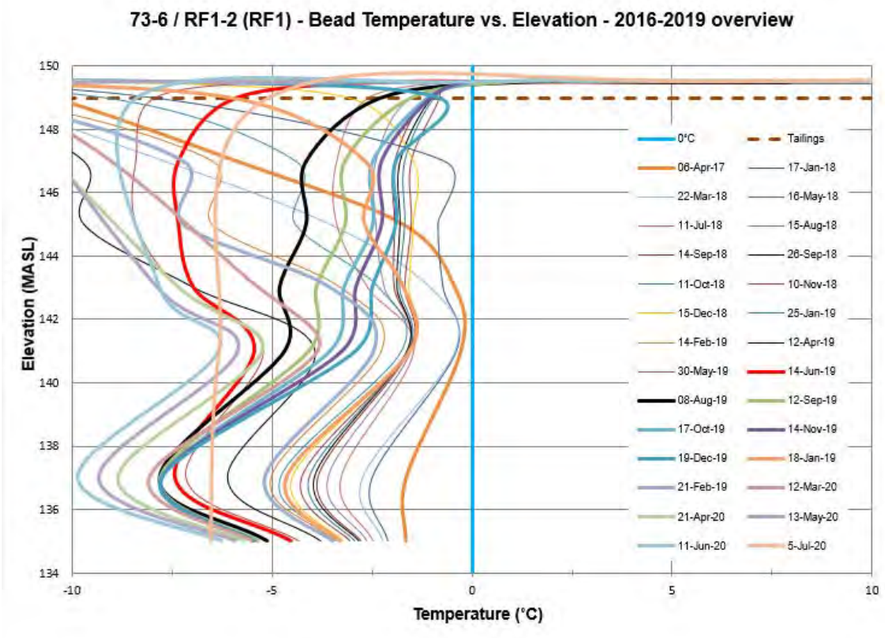
PROJECT	AGNICO EAGLE MINES LIMITED MEADOWBANK GOLD PROJECT NUNAVUT
TITLE	VAULT DIKE NODAL THERMAL TIMELINES (Apr 1/13 to Aug 27/20)

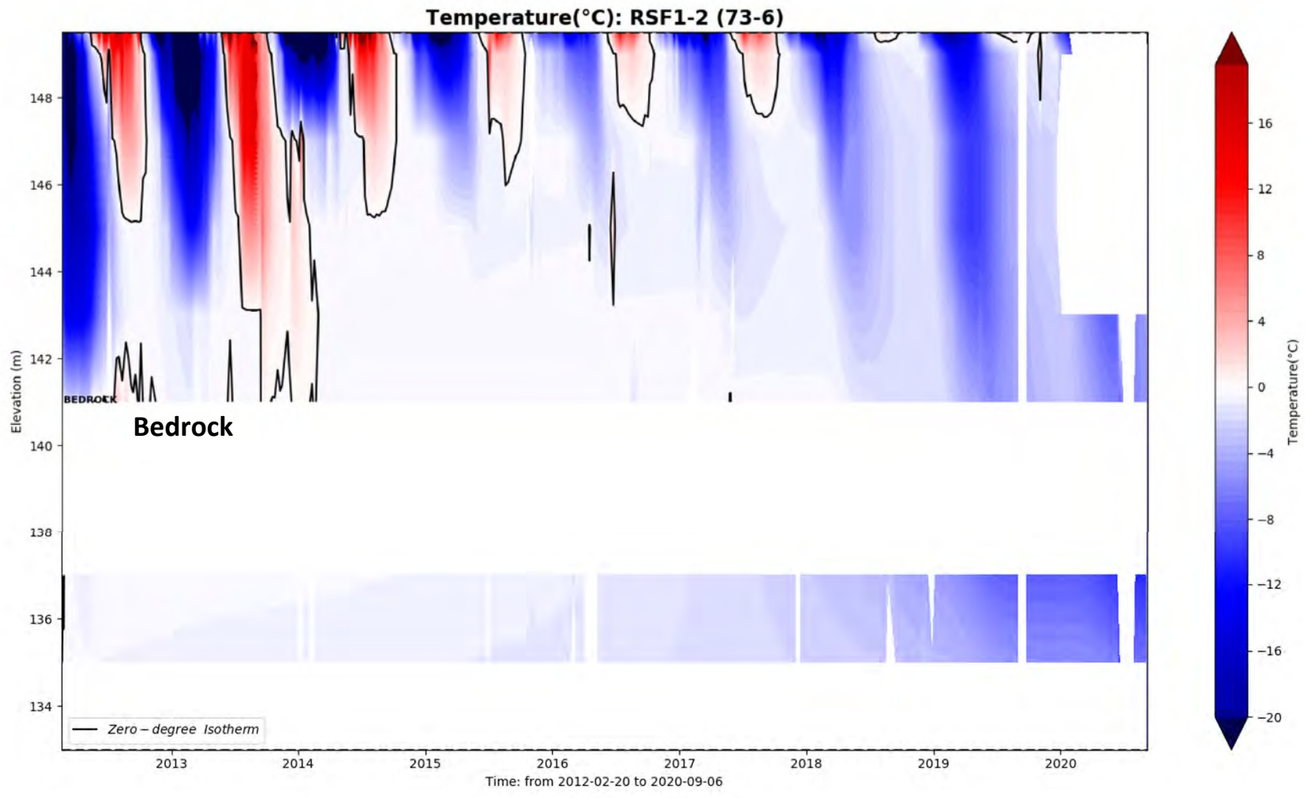
AGNICO EAGLE
MEADOWBANK

PROJECT No.			PHASE No.	
DESIGN	TD	28AUG14	SCALE AS SHOWN	REV.
CADD	TD	28AUG14	FIGURE 56	
CHECK	PG	28AUG14		
REVIEW				

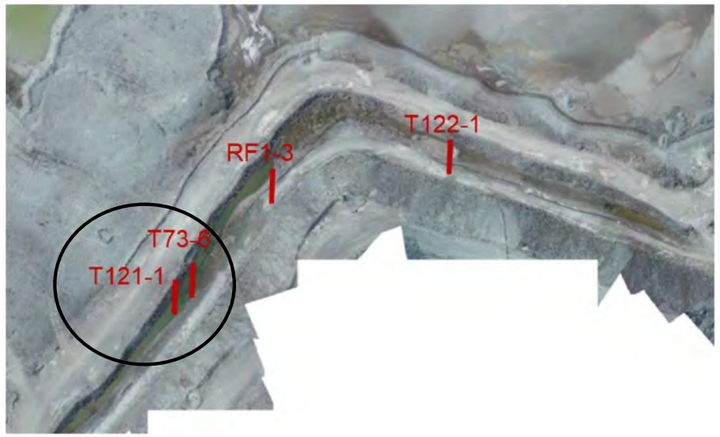
RF1 & RF2
RSF1-3 (73-6)

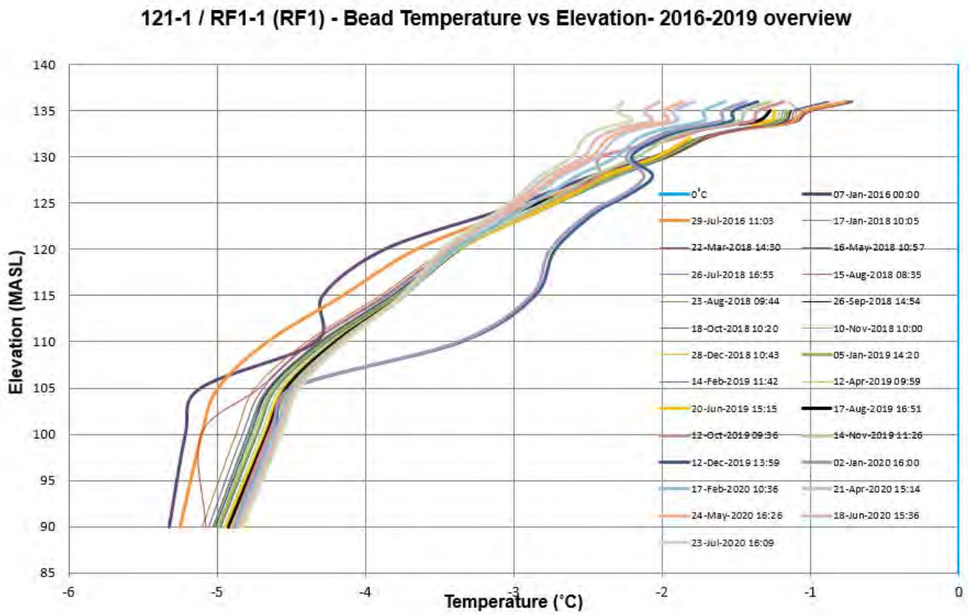


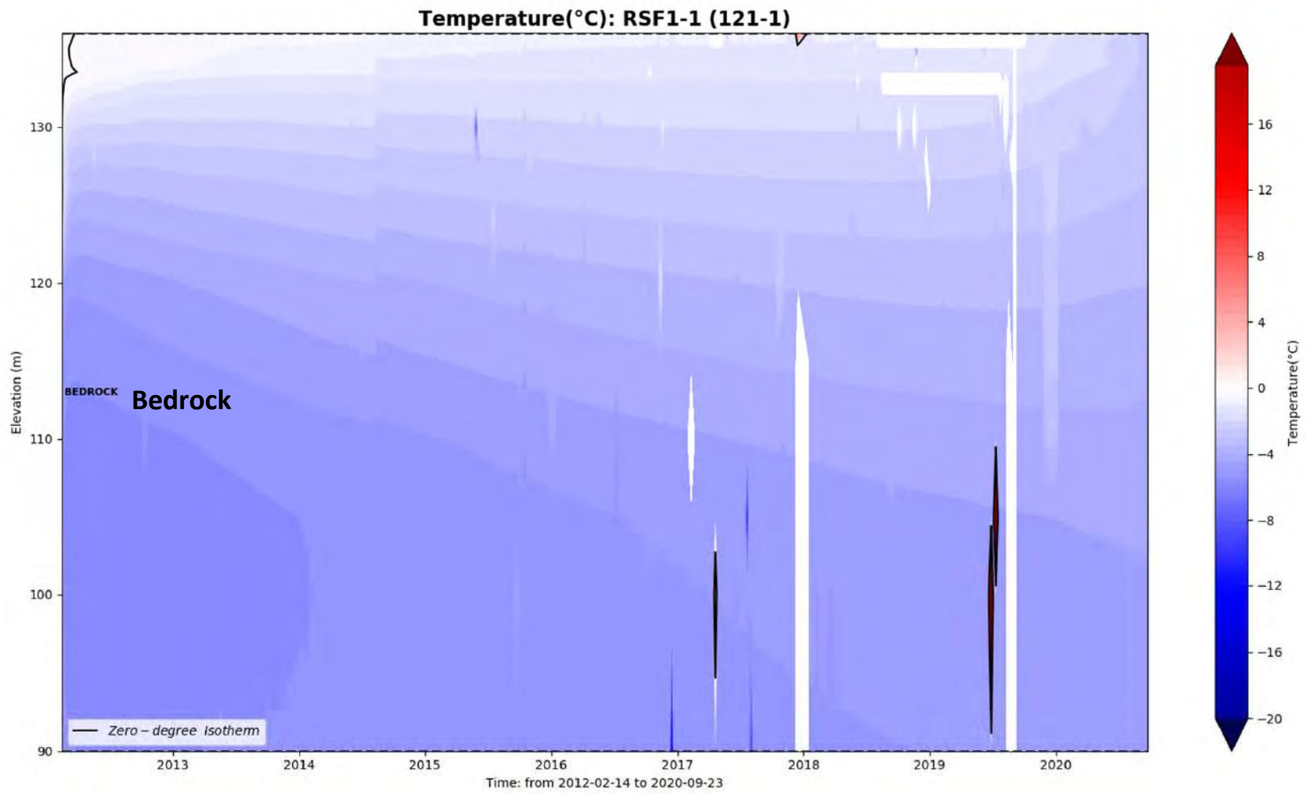




RF1 & RF2
RSF1-1 (121-1)

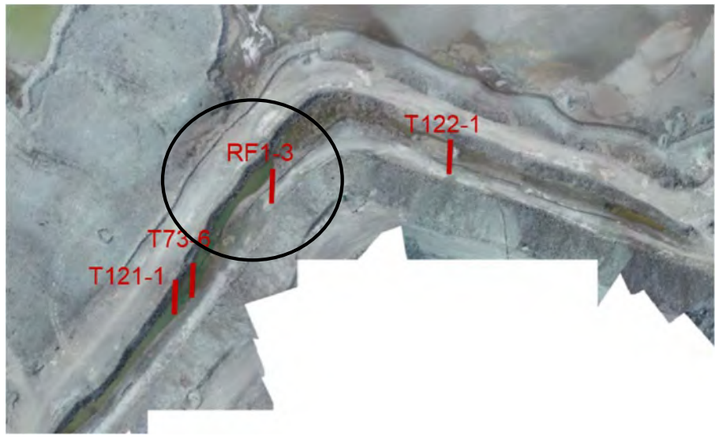


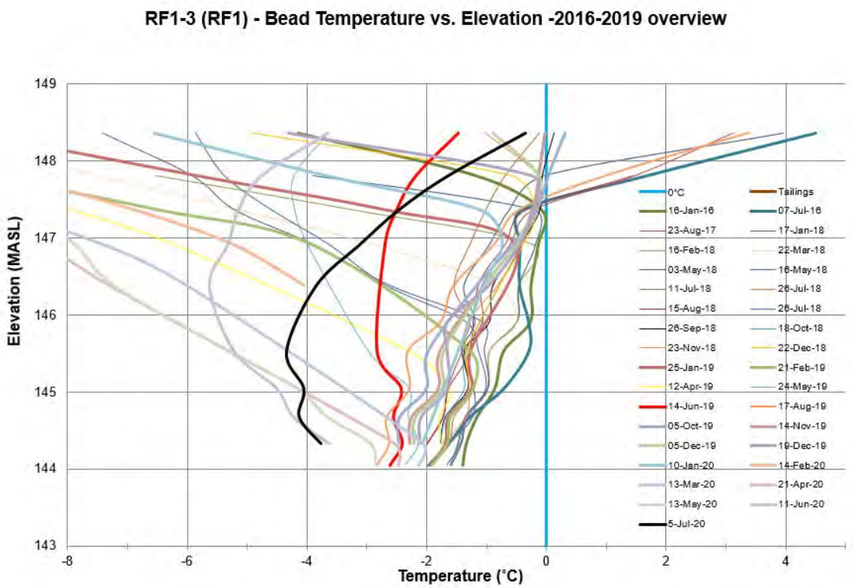


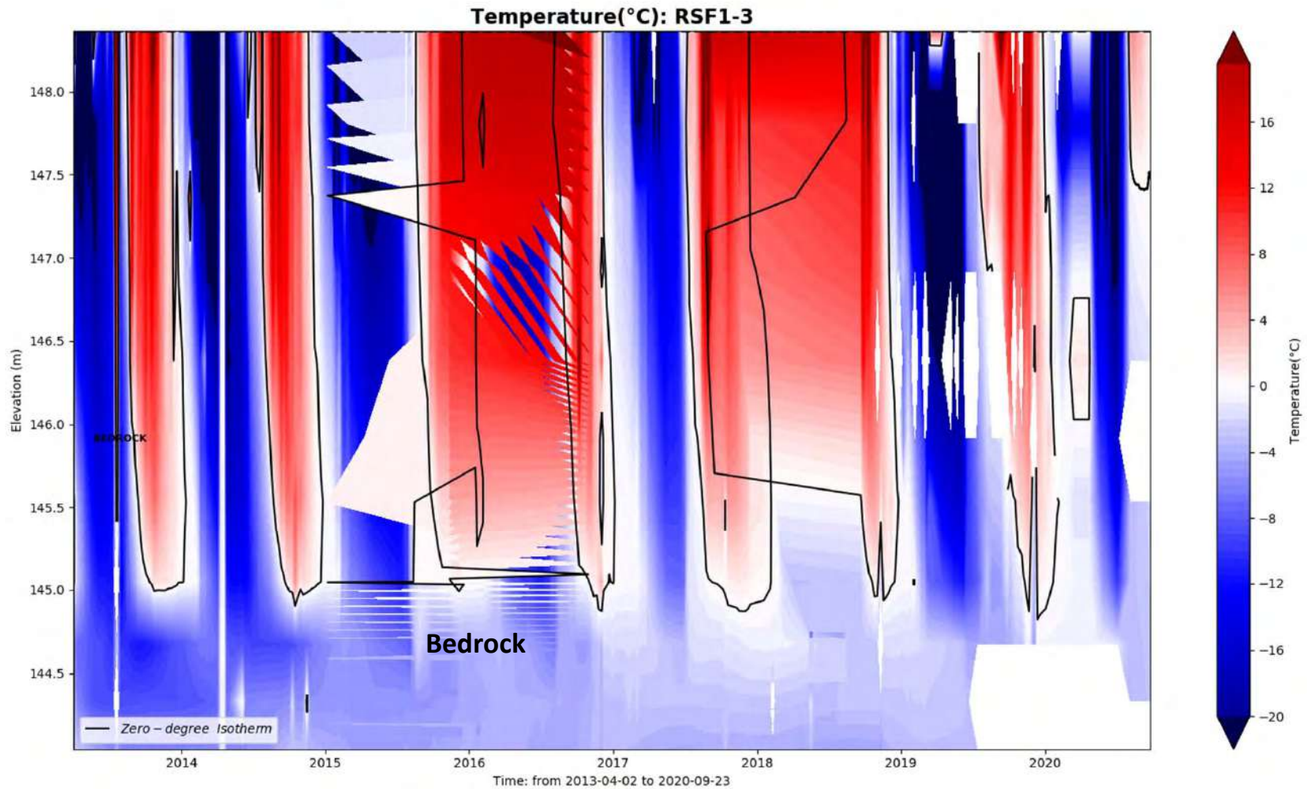


RF1 & RF2
RSF1-3 (RF1)

Along Slope of RF1

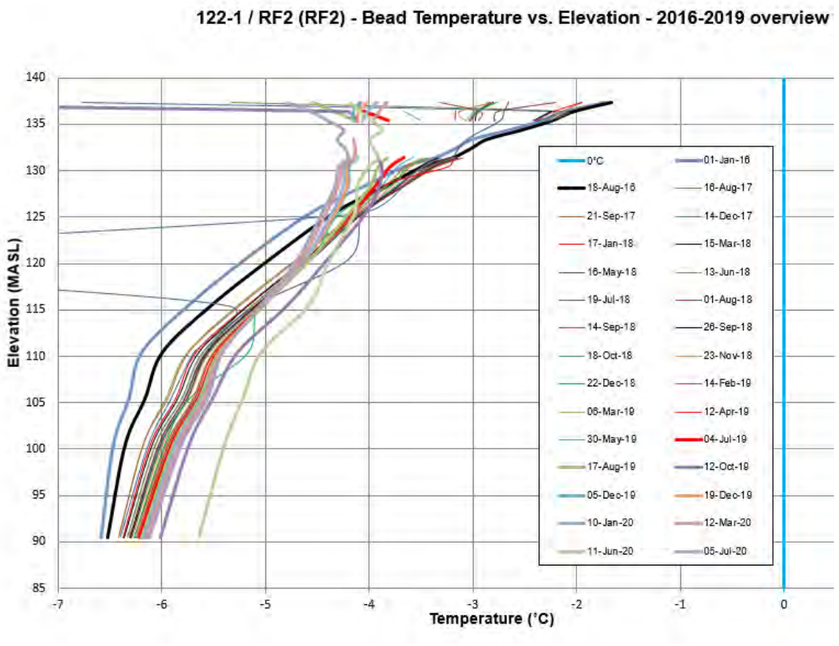


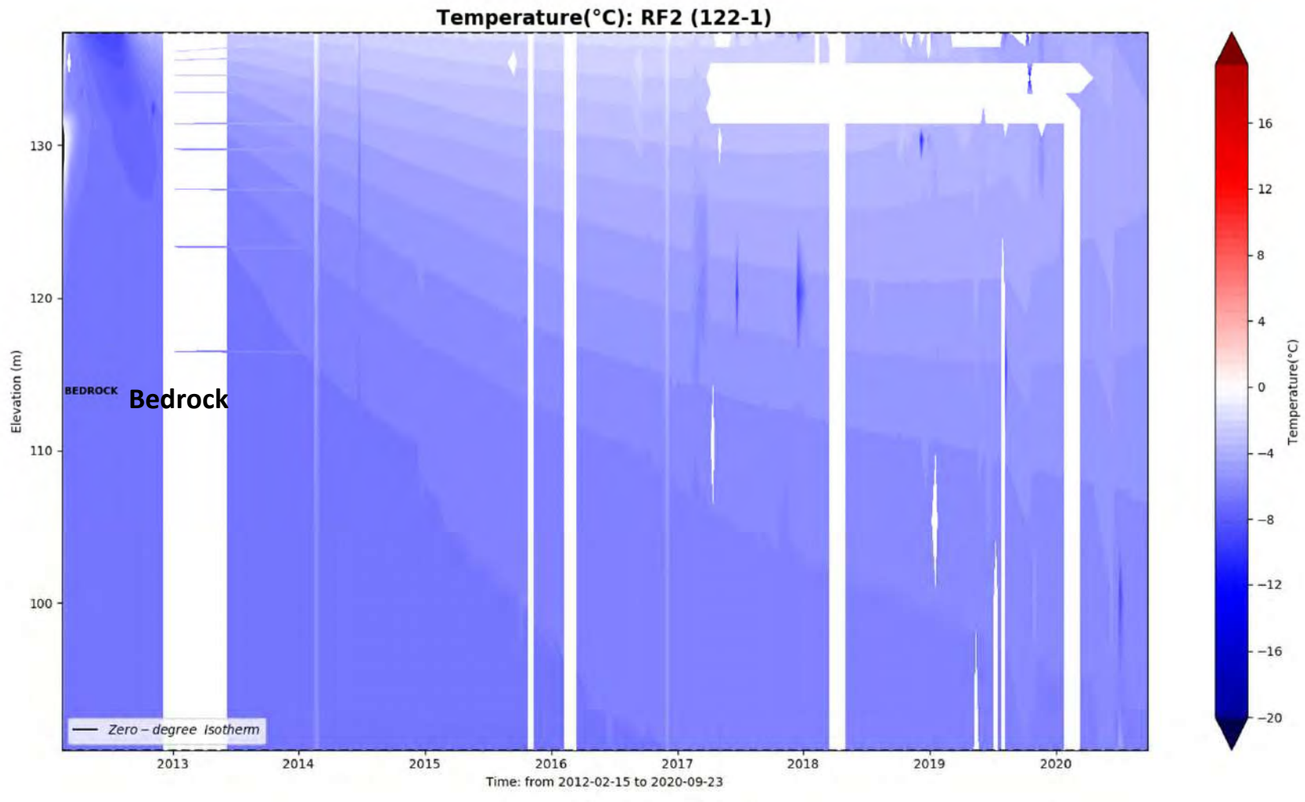




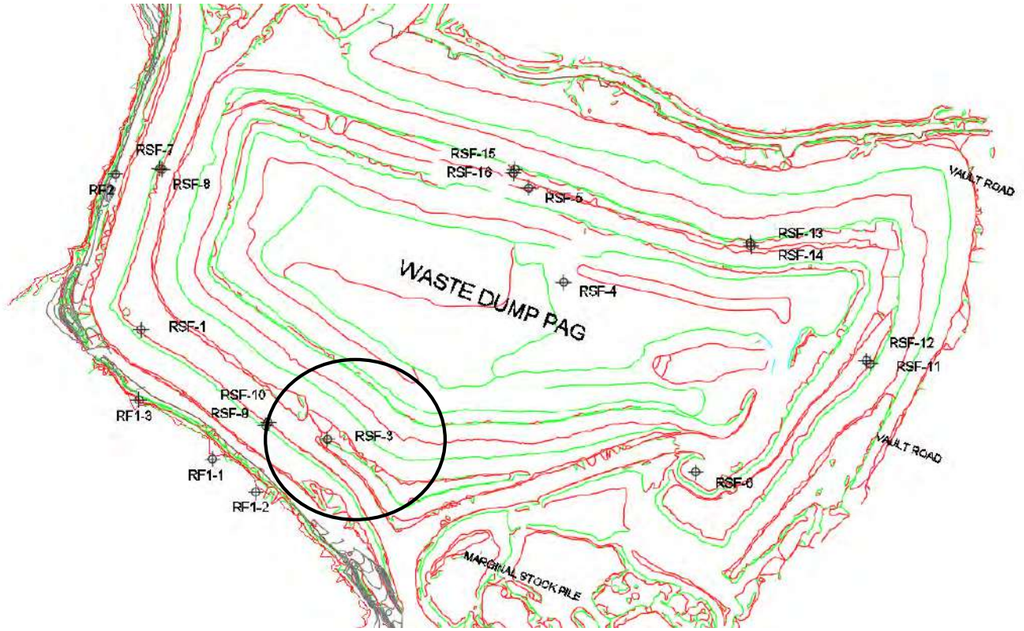
RF1 & RF2
RF2 (122-1)

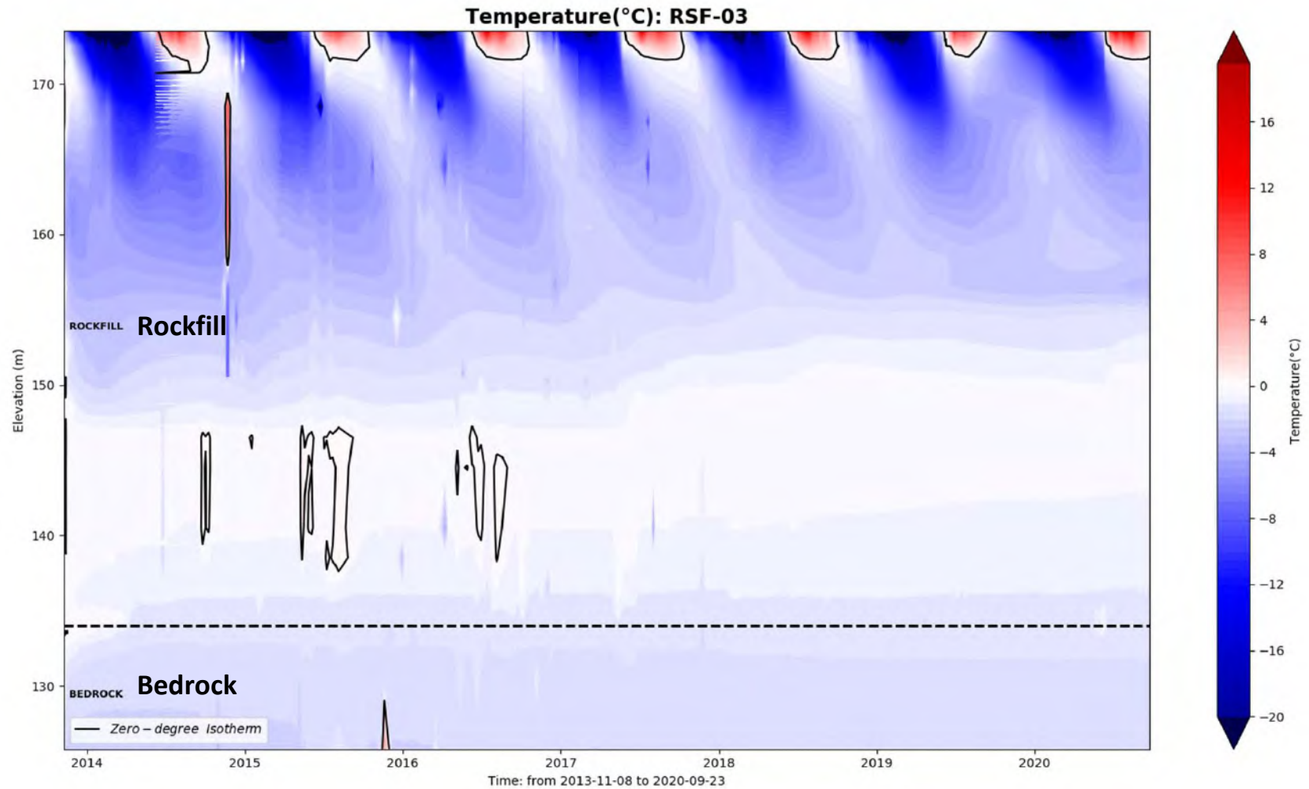




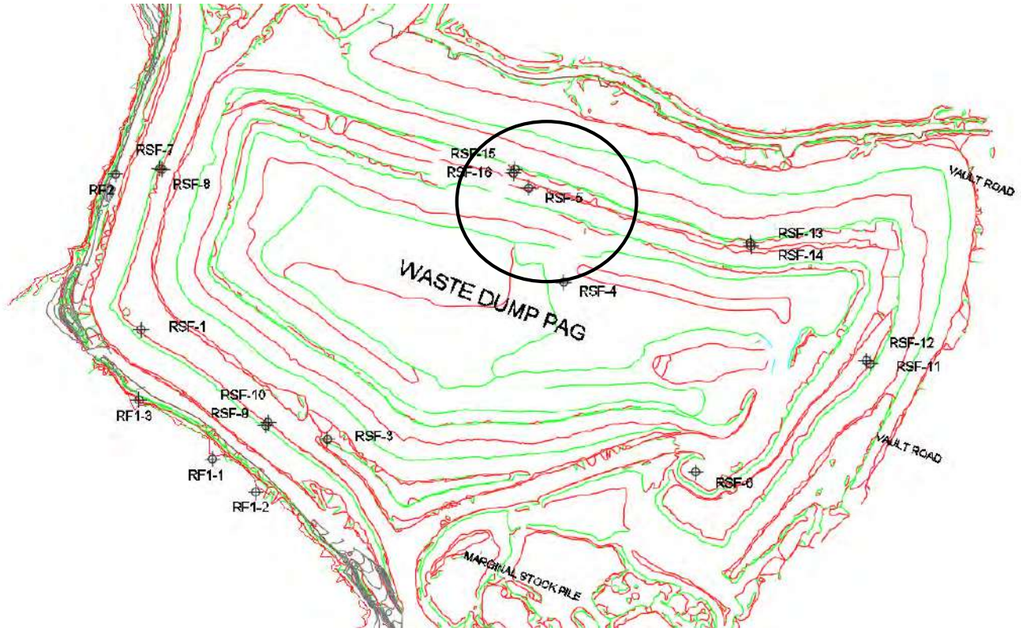


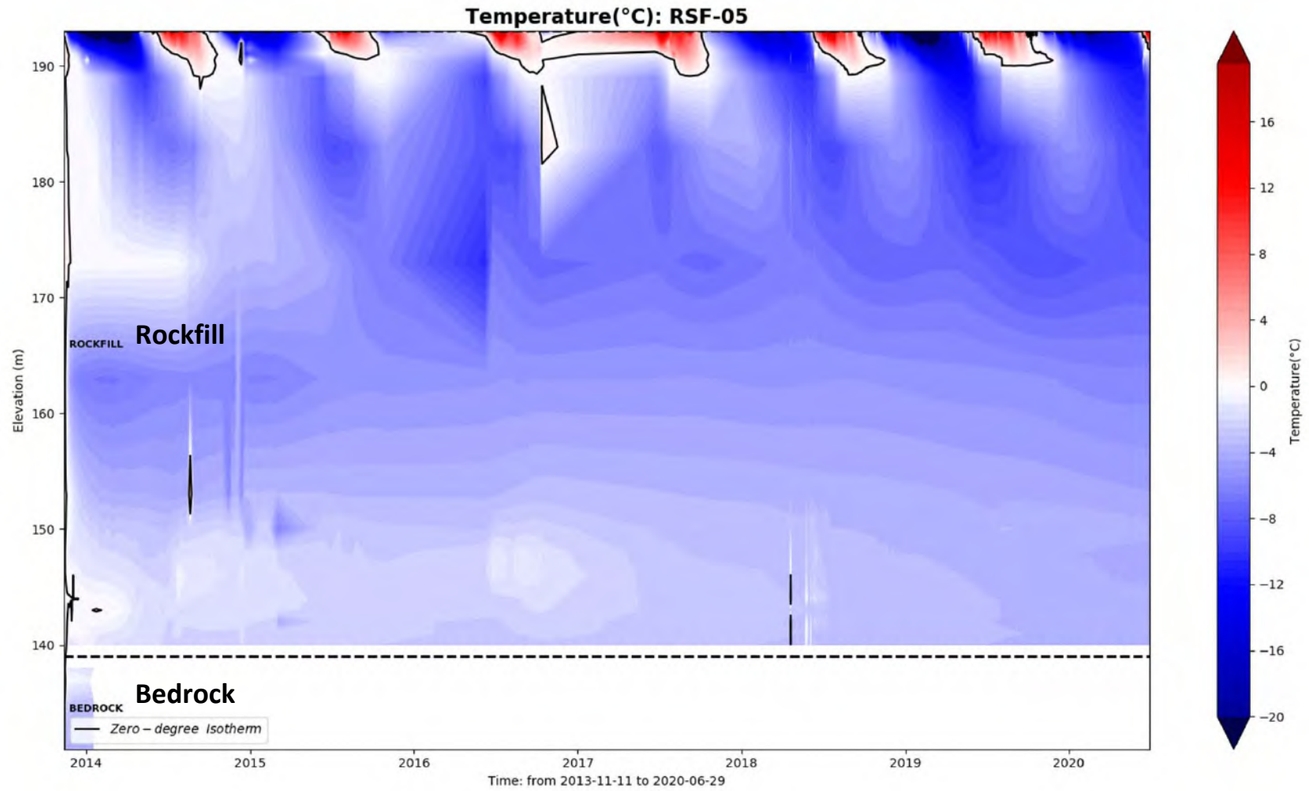
WRSF
RSF 03


RSF-7
RSF-8
RSF-15
RSF-16
RSF-5
VAULT ROAD
RSF-13
RSF-14
WASTE DUMP PAG
RSF-4
RSF-1
RSF-12
RSF-11
RSF-10
RSF-9
RF1-3
RSF-3
RF1-1
RF1-2
RSF-6
VAULT ROAD
MARGINAL STOCKPILE

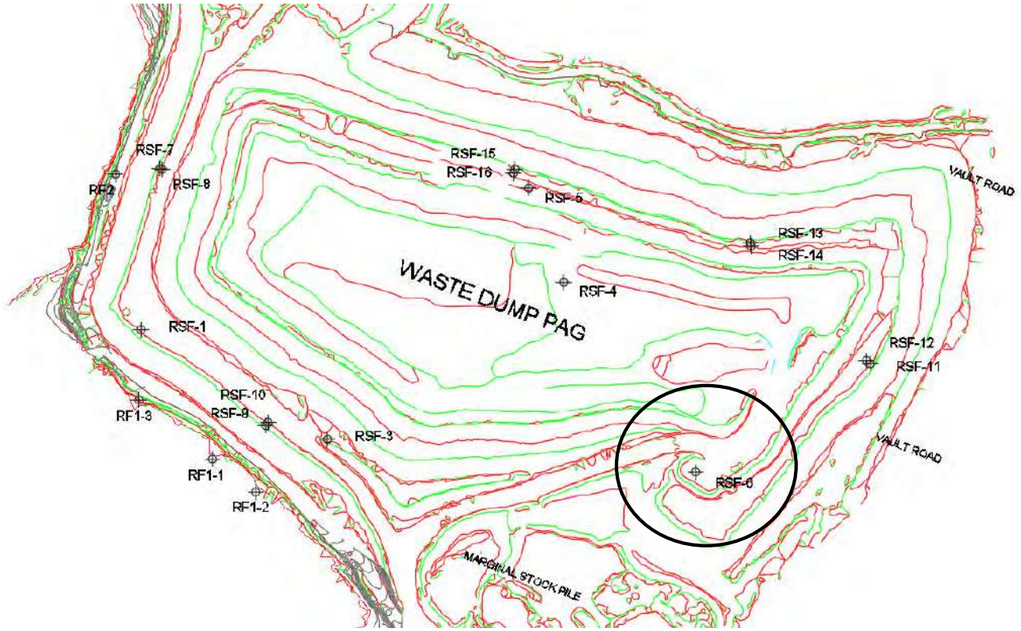

Temperature(°C): RSF-03
ROCKFILL
Rockfill
BEDROCK
Bedrock
Zero – degree Isotherm
Elevation (m)
170
160
150
140
130
2014
2015
2016
2017
2018
2019
2020
Time: from 2013-11-08 to 2020-09-23
Temperature(°C)
16
12
8
4
0
−4
−8
−12
−16
−20

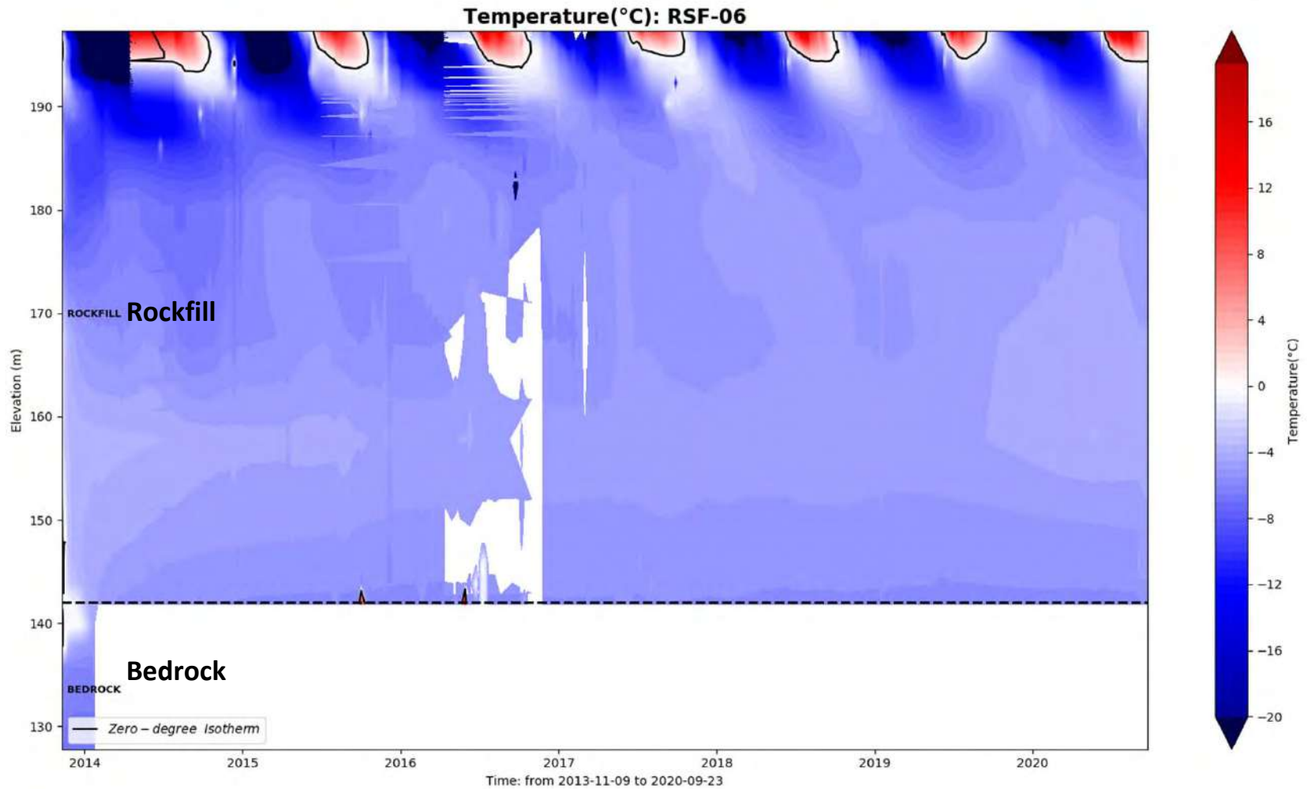
WRSF
RSF 05


RSF-7
RSF-8
RF1-3
RSF-15
RSF-16
RSF-5
VAULT ROAD
RSF-13
RSF-14
WASTE DUMP PAG
RSF-4
RSF-1
RSF-12
RSF-11
RSF-10
RSF-9
RF1-3
RSF-3
RF1-1
RF1-2
RSF-0
VAULT ROAD
MARGINAL STOCK PILE

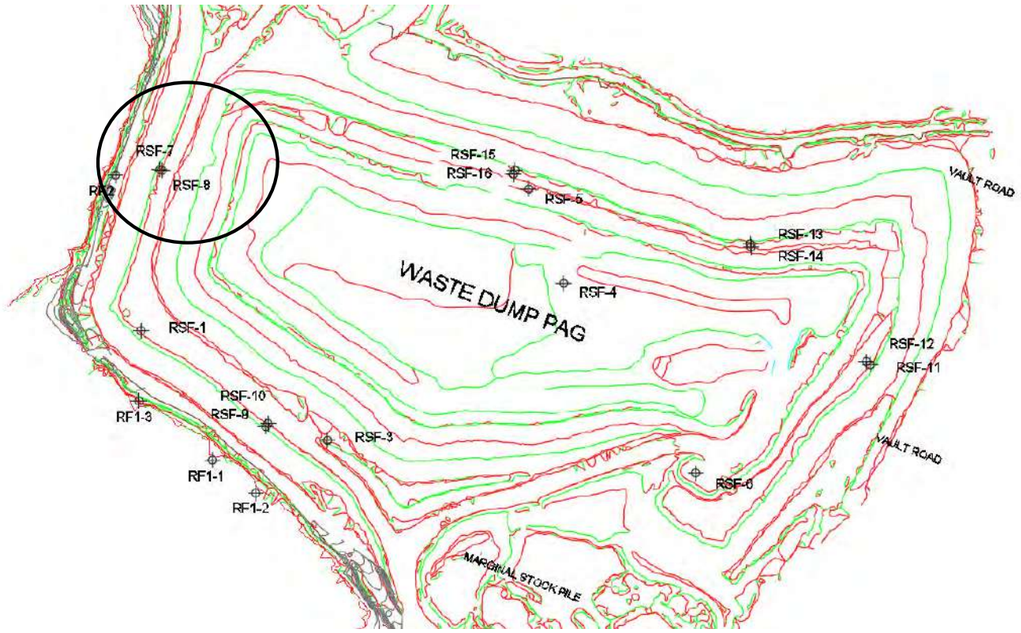

Temperature(°C): RSF-05
Elevation (m)
190
180
170
160
150
140
ROCKFILL
Rockfill
BEDROCK
Bedrock
Zero – degree Isotherm
2014
2015
2016
2017
2018
2019
2020
Time: from 2013-11-11 to 2020-06-29
Temperature(°C)
16
12
8
4
0
−4
−8
−12
−16
−20

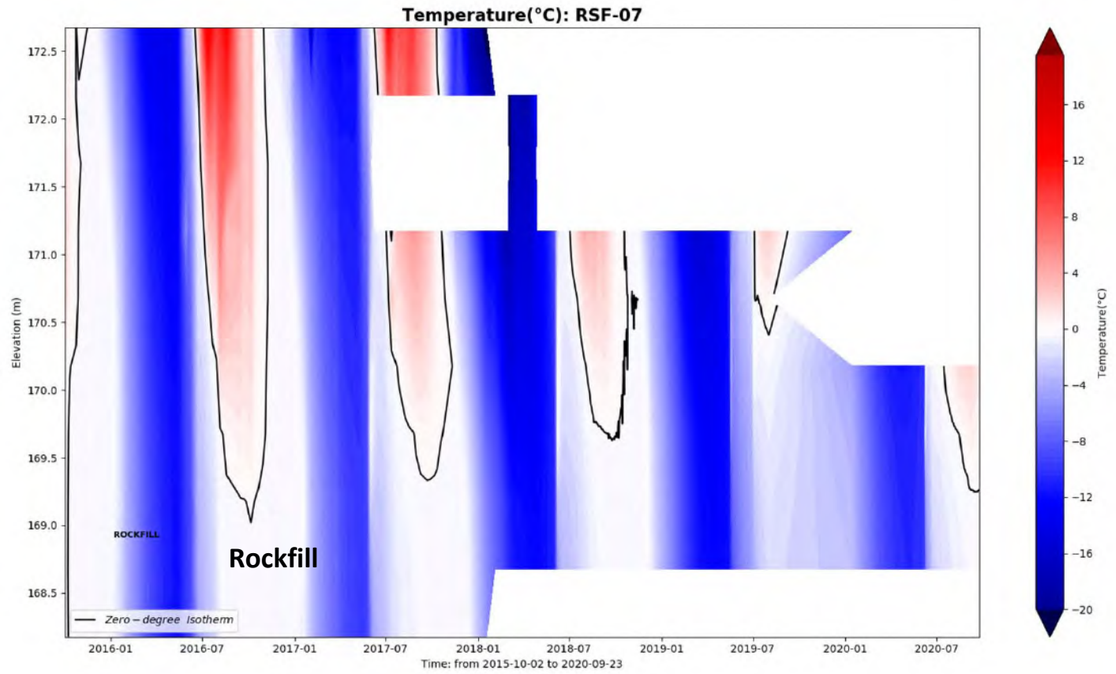
WRSF
RSF 06

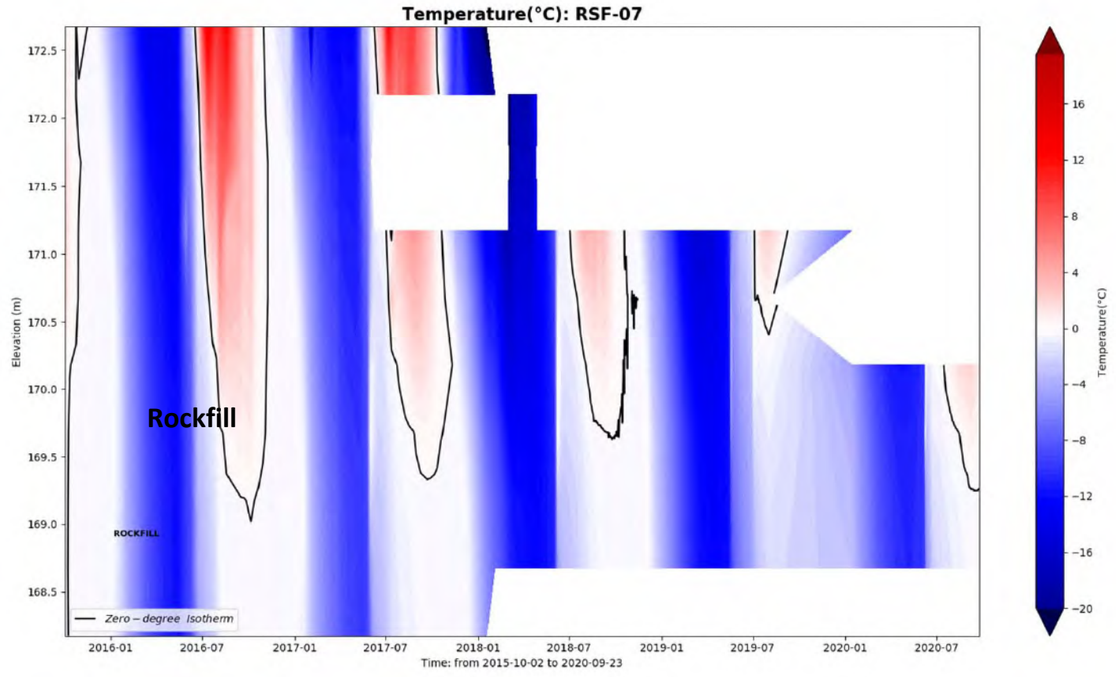

RSF-7
RSF-8
RF1-3
RSF-15
RSF-16
RSF-5
VAULT ROAD
RSF-13
RSF-14
WASTE DUMP PAG
RSF-4
RSF-1
RSF-12
RSF-11
RSF-10
RSF-9
RF1-3
RSF-3
VAULT ROAD
RF1-1
RSF-0
RF1-2
MARGINAL STOCK PILE


Temperature(°C): RSF-06
ROCKFILL Rockfill
Bedrock
BEDROCK
Zero – degree Isotherm
Elevation (m)
Temperature(°C)
Time: from 2013-11-09 to 2020-09-23

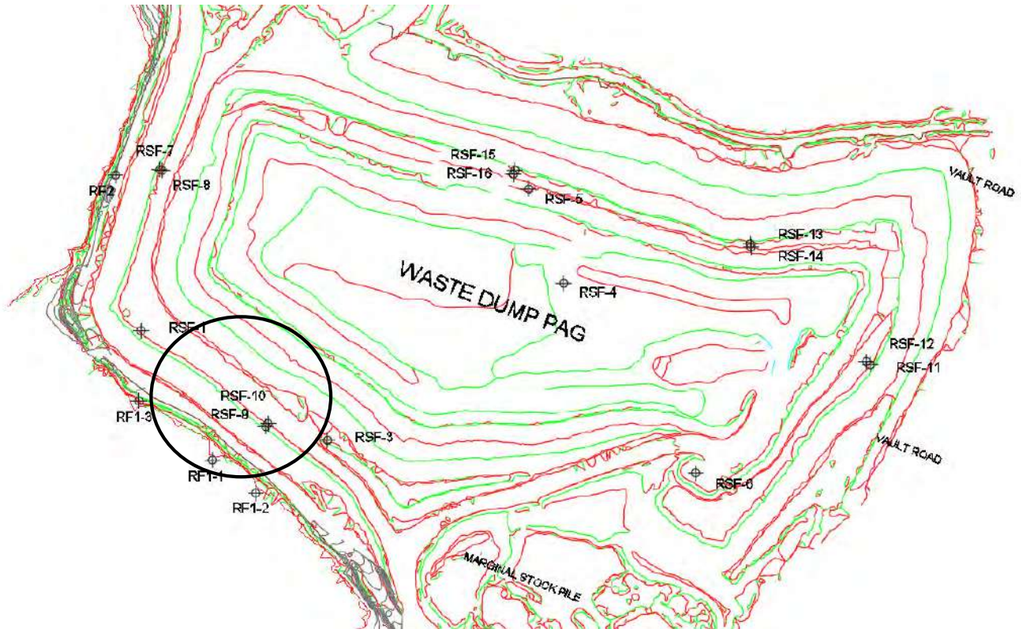
WRSF
RSF 07 & RSF 08

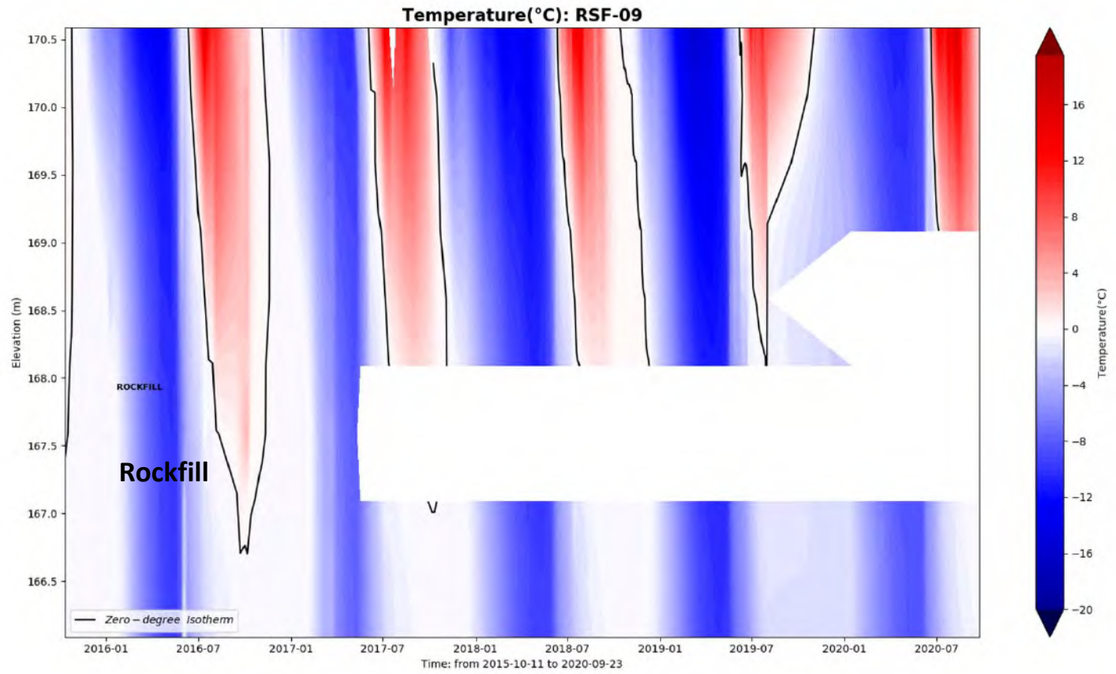


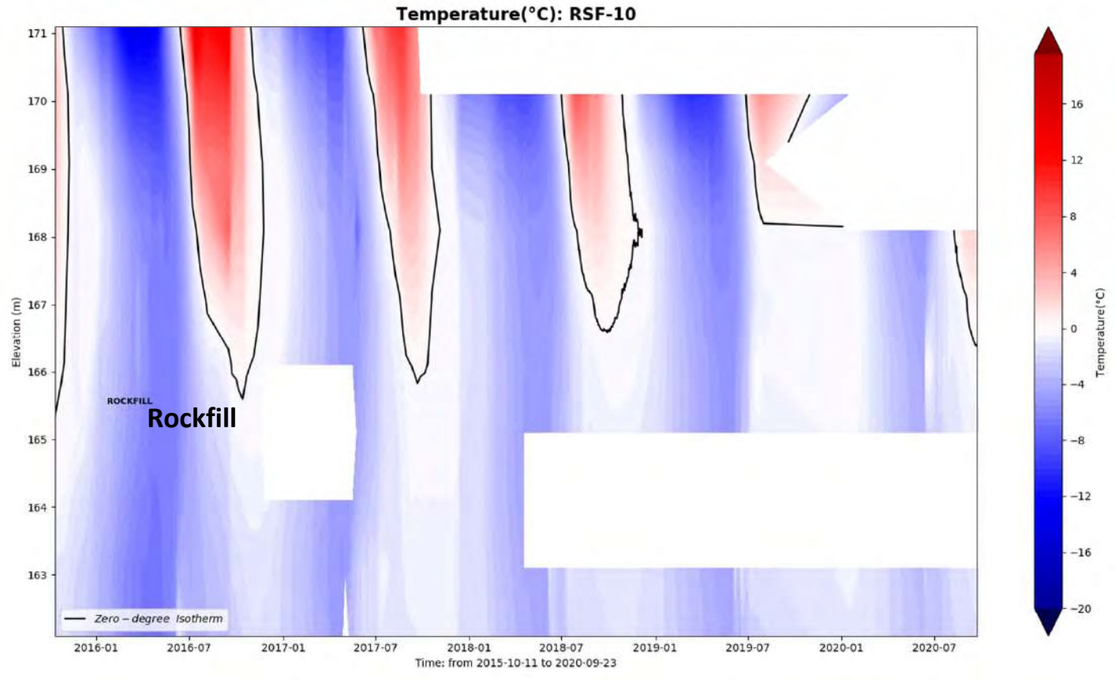




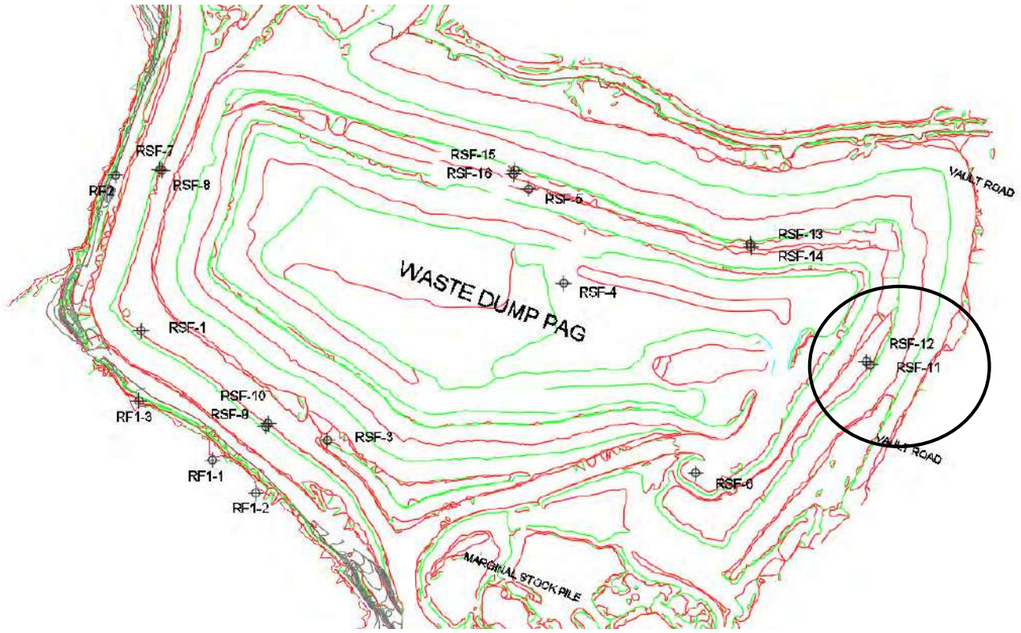
WRSF
RSF 09 & RSF 10

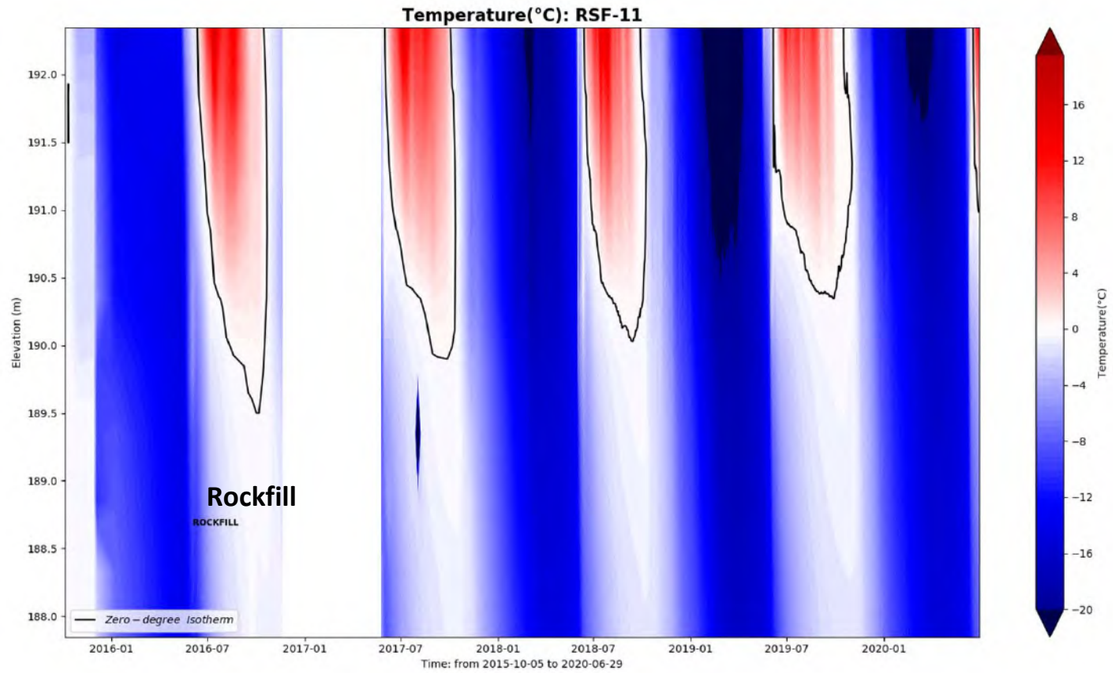


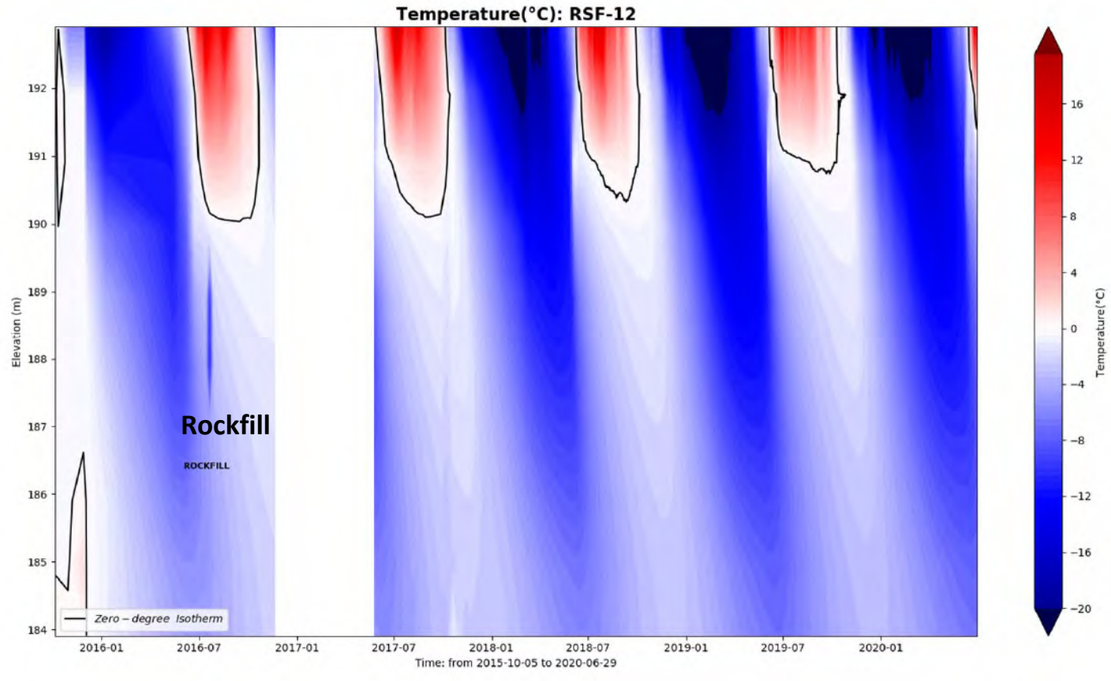




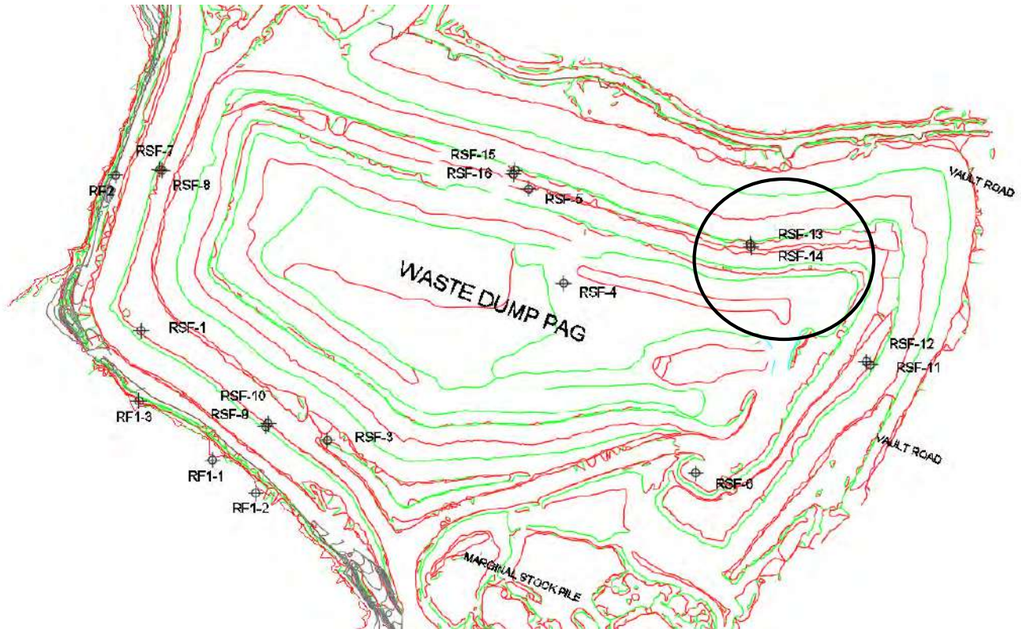
WRSF
RSF 11 & RSF 12

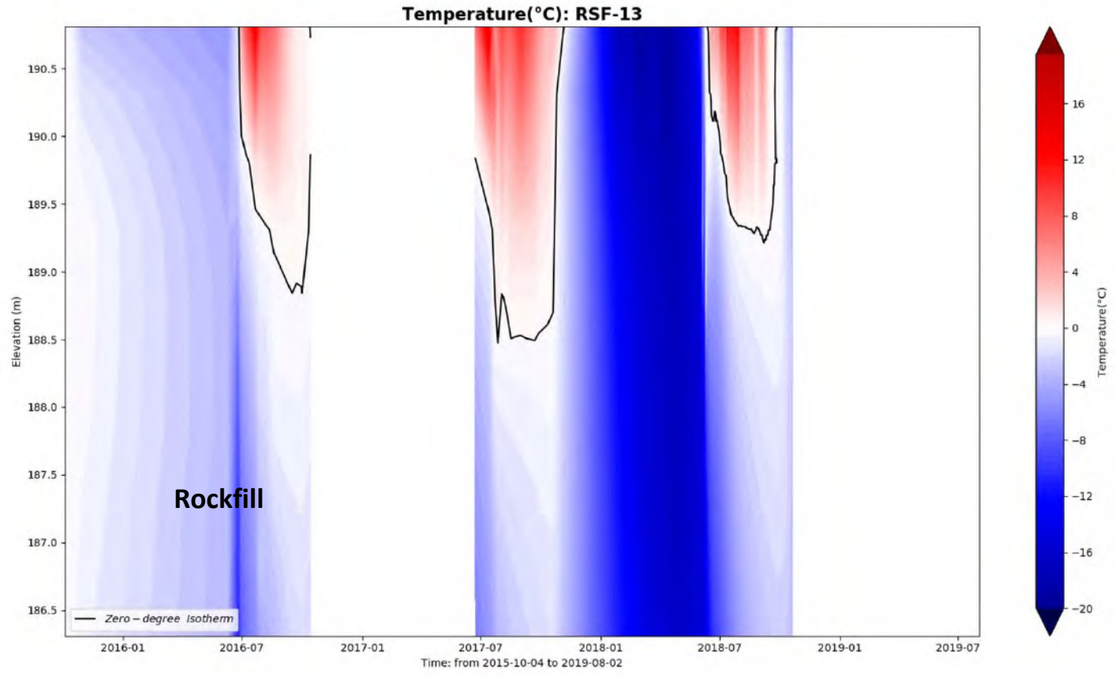


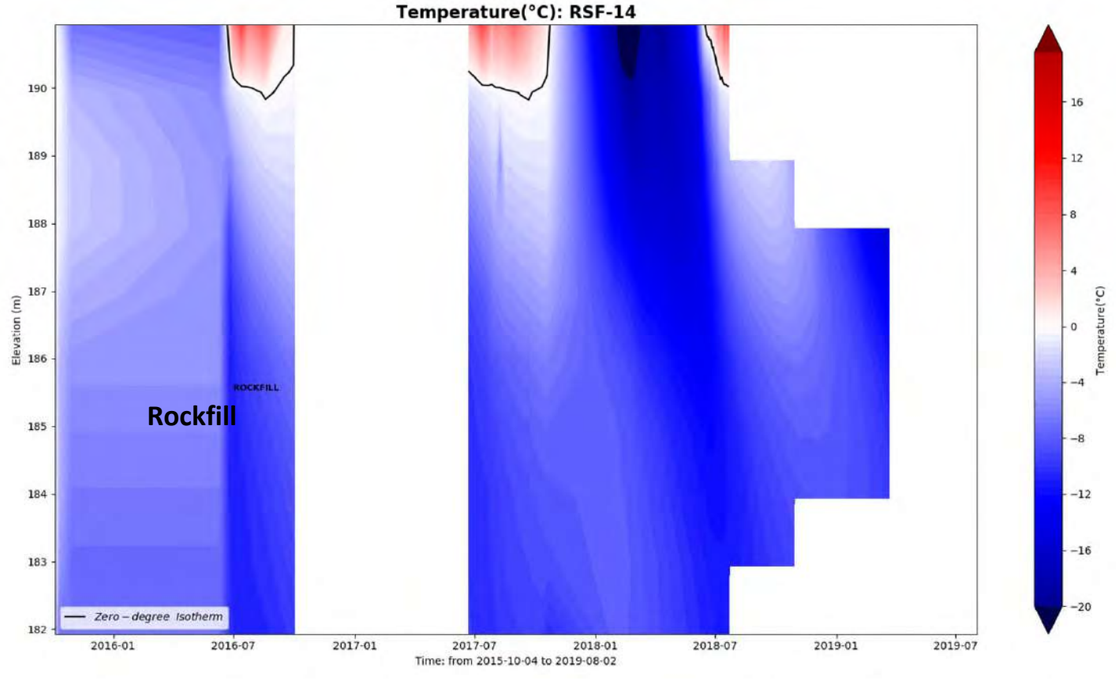




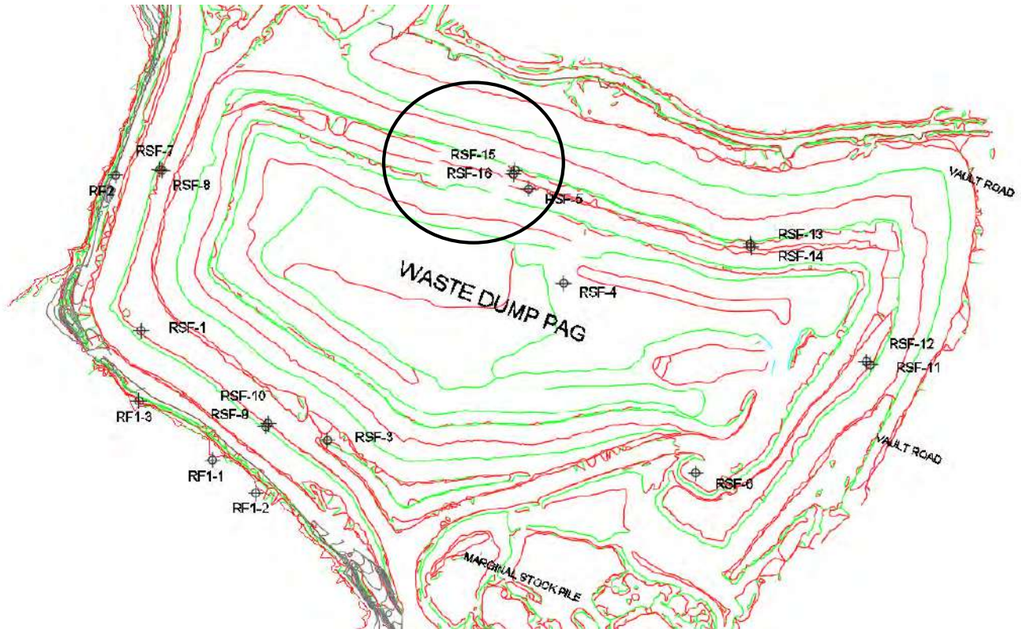
WRSF
RSF 13 & RSF 14

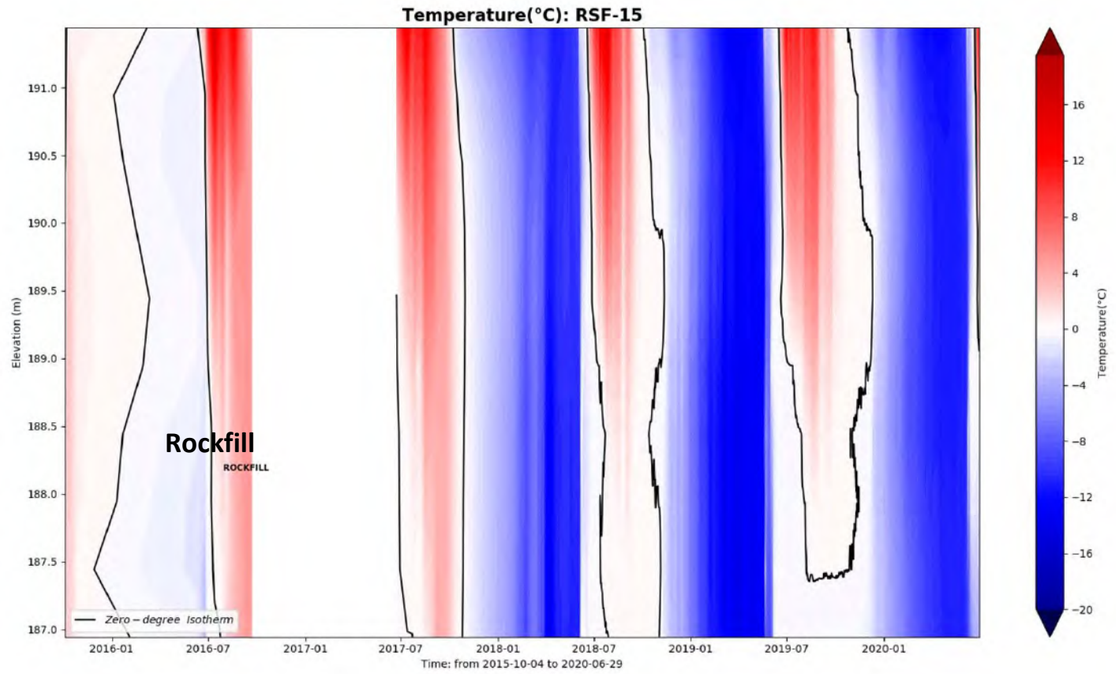


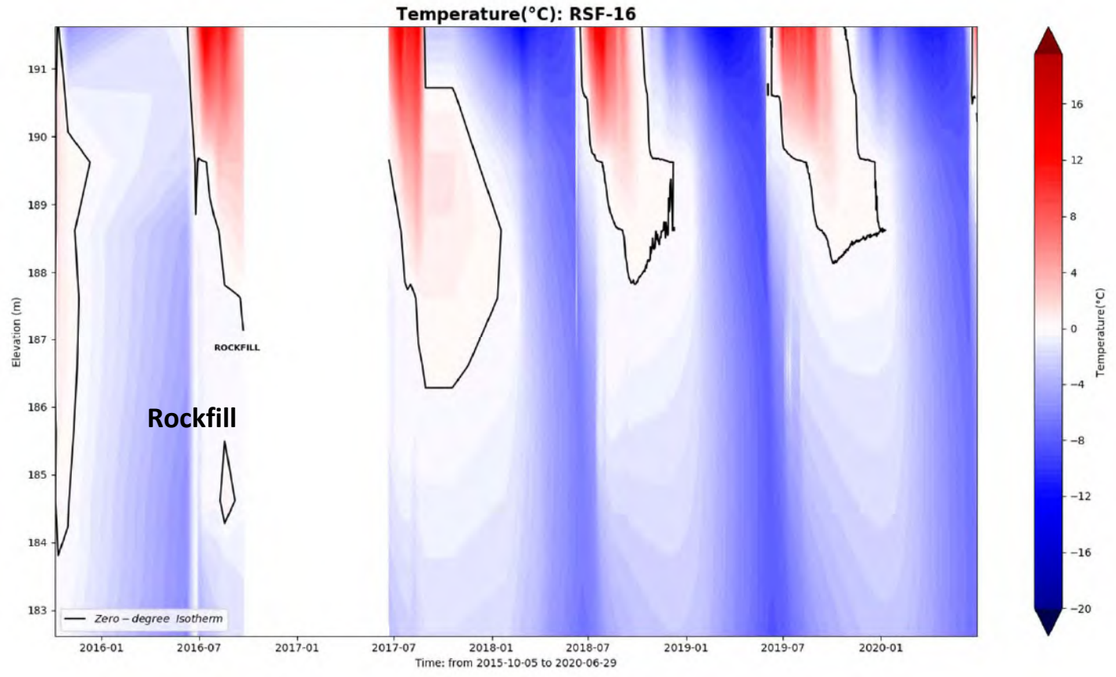




WRSF
RSF 15 & RSF 16



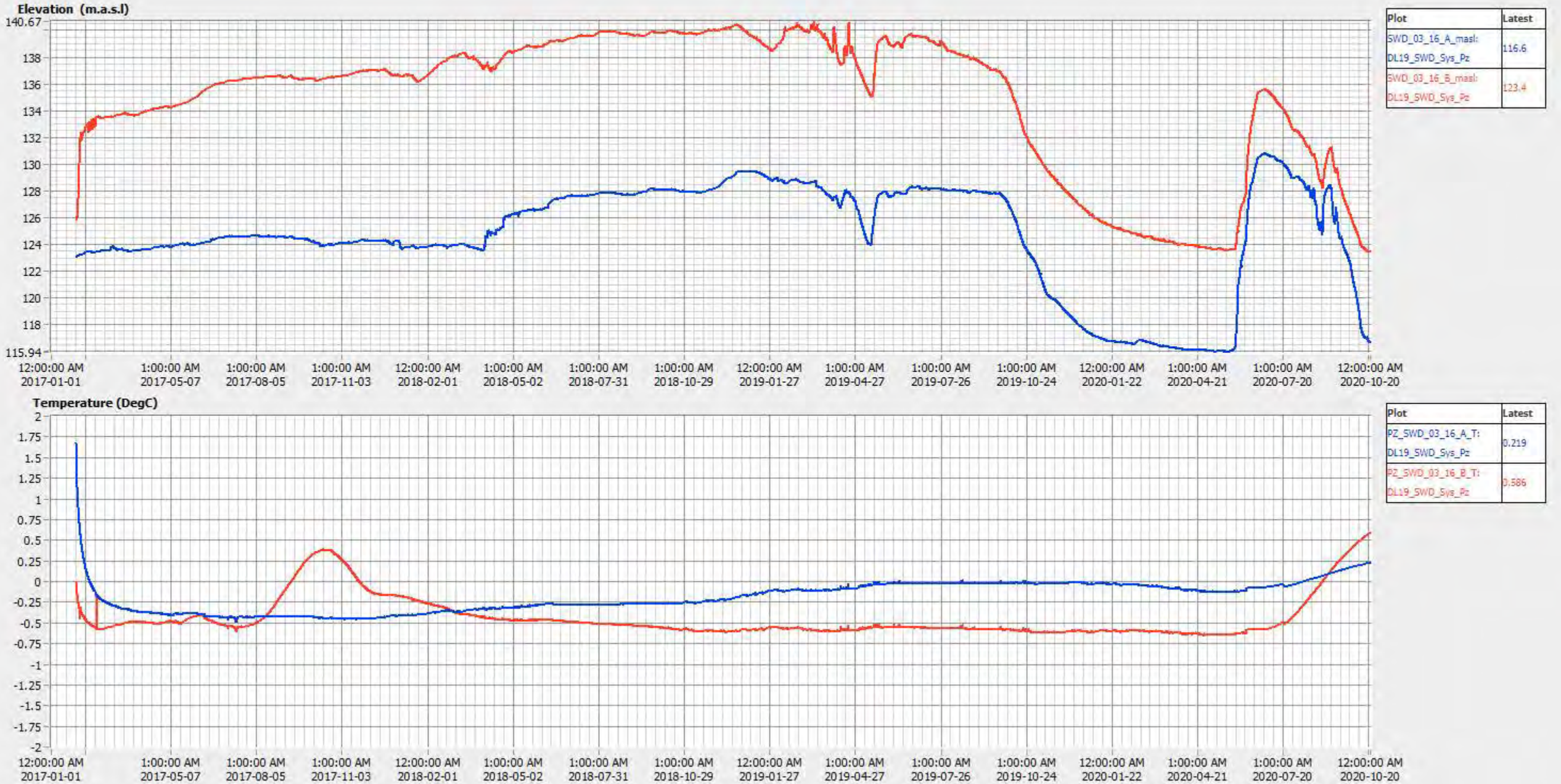




13 - SWD: SWD_03_16

2 days

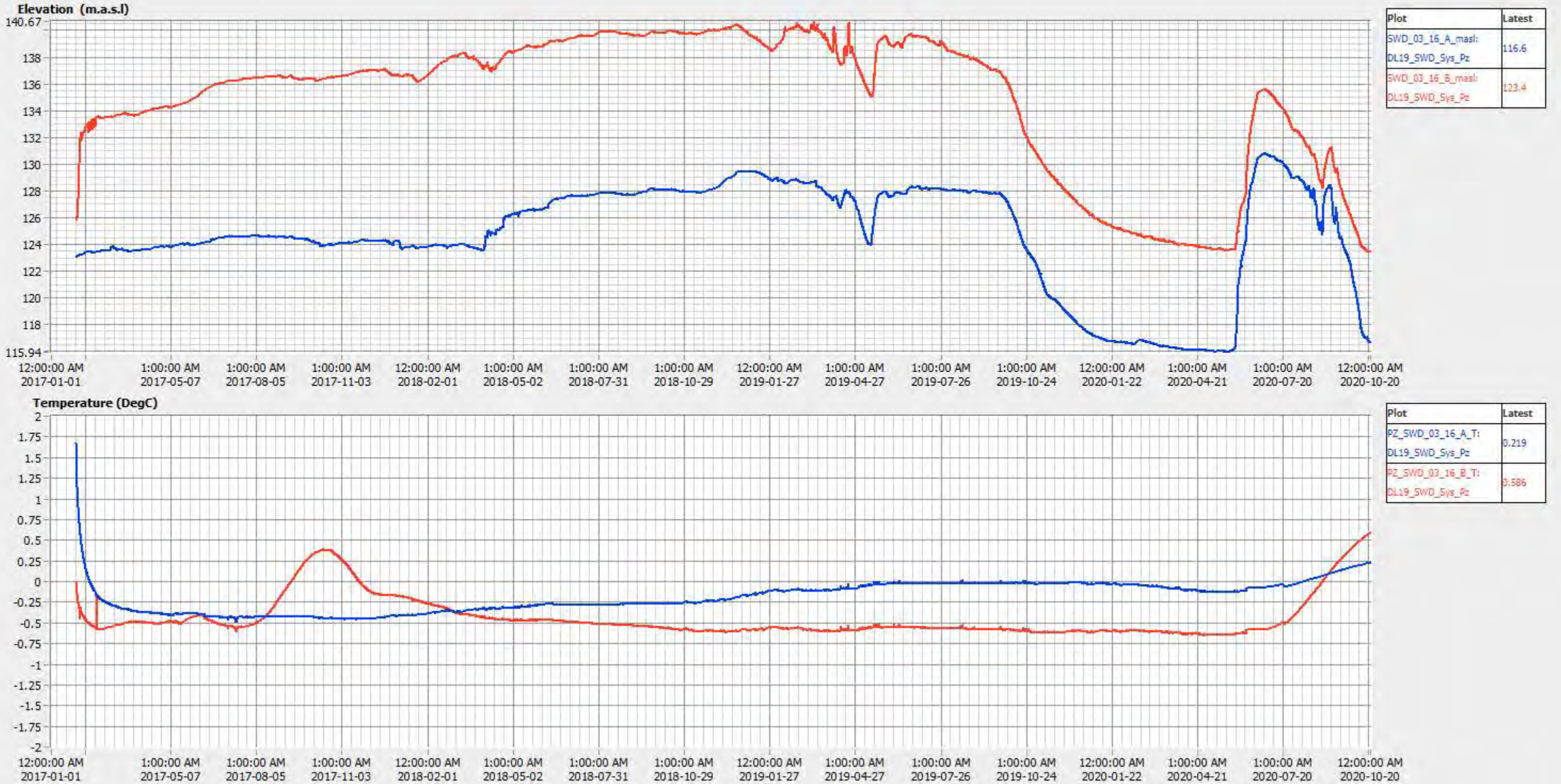
0 0

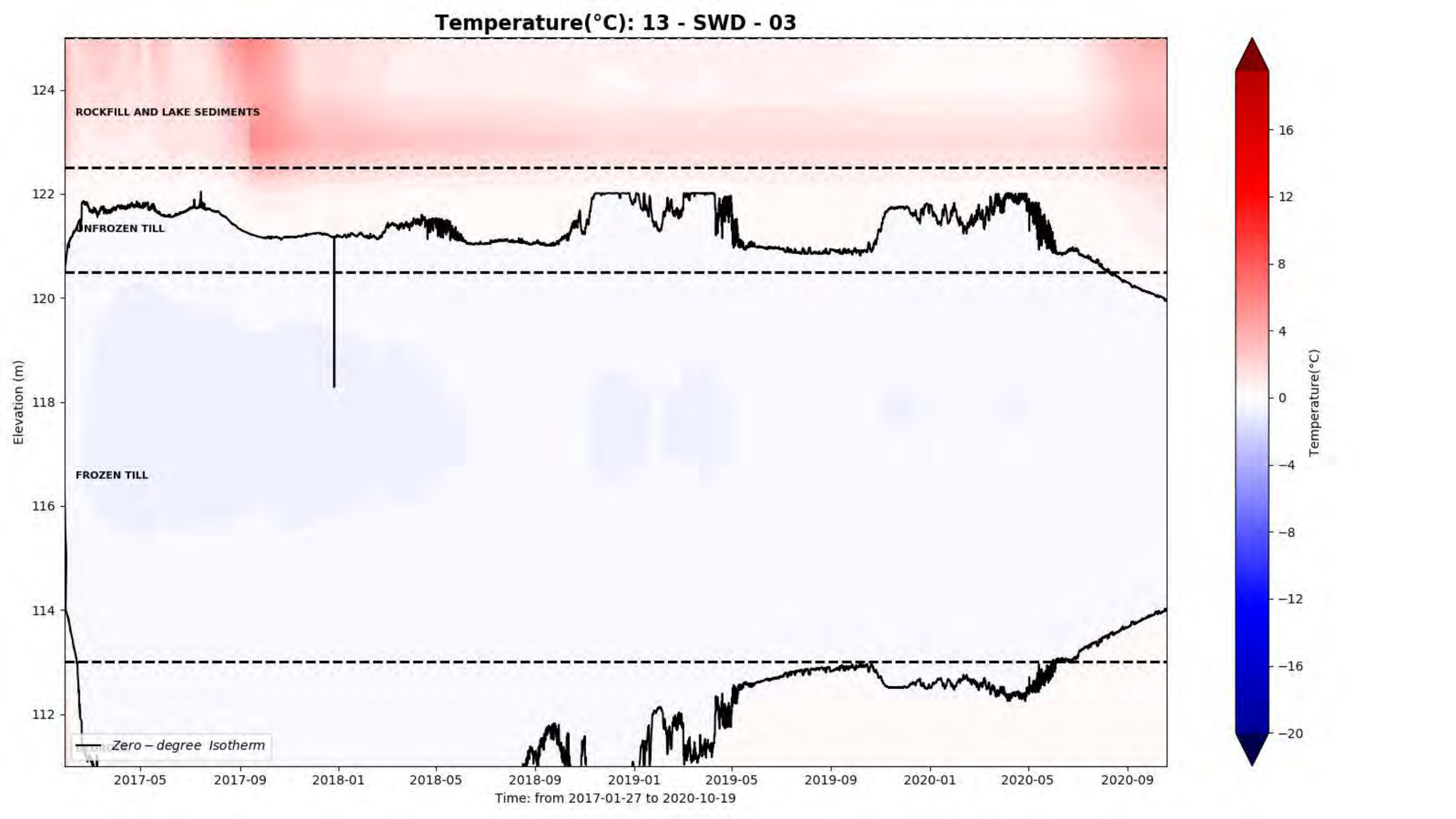


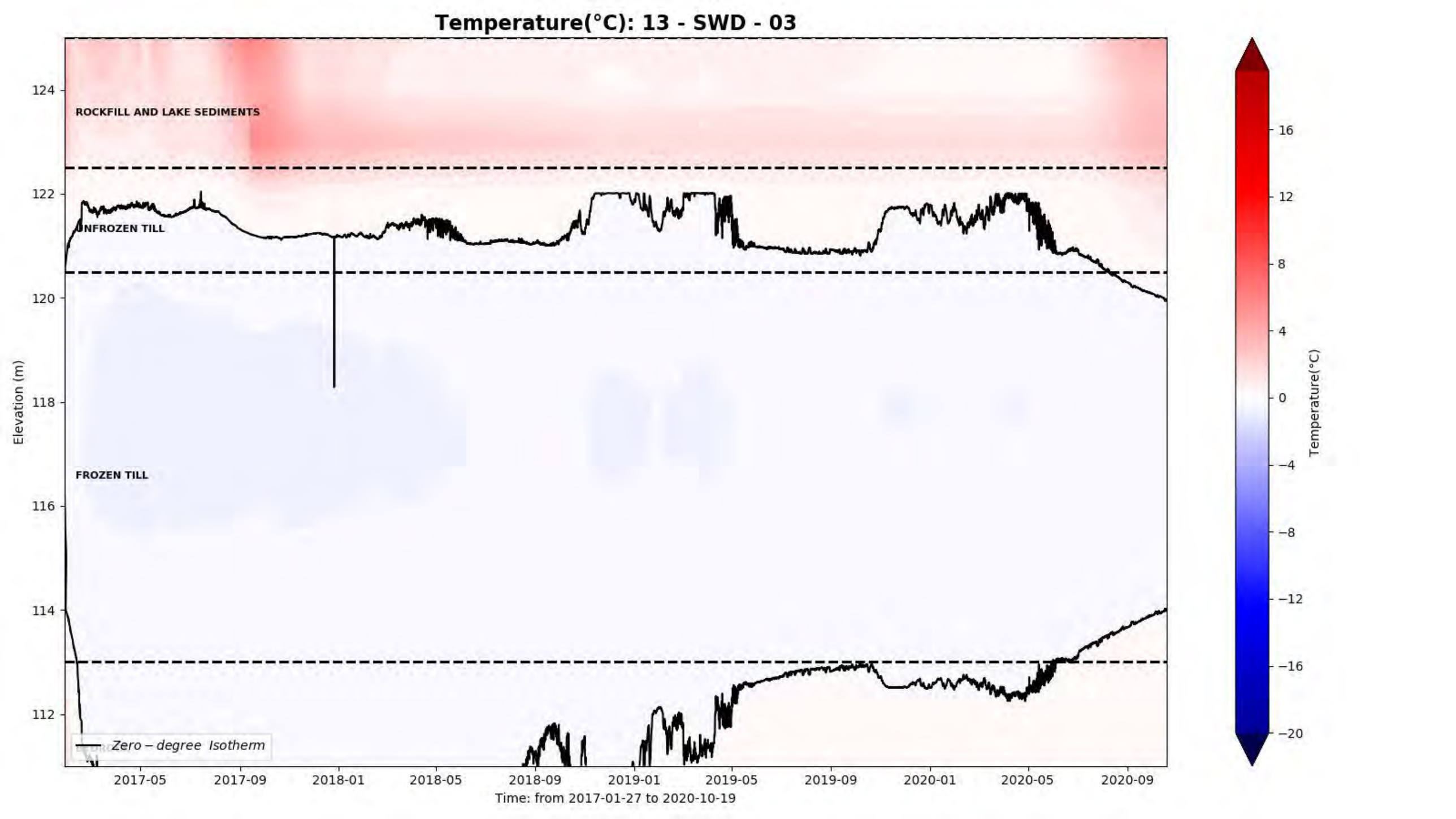
13 - SWD: SWD_03_16

2 days

0 0




Temperature(°C): 13 - SWD - 03
ROCKFILL AND LAKE SEDIMENTS
UNFROZEN TILL
FROZEN TILL
Zero – degree Isotherm
Elevation (m)
124
122
120
118
116
114
112
2017-05
2017-09
2018-01
2018-05
2018-09
2019-01
2019-05
2019-09
2020-01
2020-05
2020-09
Time: from 2017-01-27 to 2020-10-19
16
12
8
4
0
−4
−8
−12
−16
−20
Temperature(°C)


Temperature(°C): 13 - SWD - 03
ROCKFILL AND LAKE SEDIMENTS
UNFROZEN TILL
FROZEN TILL
Zero – degree Isotherm
Elevation (m)
124
122
120
118
116
114
112
2017-05
2017-09
2018-01
2018-05
2018-09
2019-01
2019-05
2019-09
2020-01
2020-05
2020-09
Time: from 2017-01-27 to 2020-10-19
16
12
8
4
0
−4
−8
−12
−16
−20
Temperature(°C)

APPENDIX D

All Weather Access Road

APPENDIX D1

AWAR Observations

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS	PHOTO
0+430	PRC1	1x600 mm CSP	Culvert owned by the town and not AEM. Minor damage to outlet. Minor obstruction of the outlet. Still in good condition. No action required	Outlet: 223
0+470	PRC2	2x600 mm CSP	Culvert owned by the town and not AEM. Good condition	Outlet: 224
1+380	PRC3	1x600 mm CSP	Culvert owned by the town and not AEM. Good condition	-
2+550	R-00A	1x600 mm CSP	No sign of any flow. Inlet partially collapsed; outlet entirely collapsed with signs of obstruction from road material.	-
4+260	PC-14	2x600 mm CSP	These 2 culverts are too damaged to function any longer. If needed, new culvert should be installed further north.	-
5+200	Quarry 1		Rocks walls are generally clean and stable.	-
~5+700	unnamed	1x600 mm CSP	The inlet is buried in gravel. The outlet is in good condition.	-
8+750	R02 Centre Bridge	30m Acrow Panel Bridge	In general good condition. The two corrugated steel bins at both abutments show deformation under the weight of the bridge.	225: north 226: south

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS	PHOTO
8+830	PC-17A	2X1800 mm CSP	Sign of erosion beneath the inlet and flow of water occuring beneath the culvert. The 1800 CSP were installed too high. While conditions are not perfect, they have proven stable over the past years. No sign of degradation from last year on both the inlet and outlet sides. Flow was observed beneath the culvert in the past, but in 2019 the flow moved further south (5-10 m from culvert). Stable, to keep monitoring for evolution.	Outlet : 227
8+850	PC-17	2x1200 mm CSP	In good condition	-
9+952	PC-1	1x600 mm CSP	In good condition	-
10+580	R-03	1x600 mm CSP	Not observed in 2020.	-
12+050	R-04	1x1200 mm CSP	In good condition	-
12+745	PC-13	1x600 mm CSP	In good condition but inlet slightly bent.	-

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS	PHOTO
13+250	Quarry 2		The wall is mostly clean. One steep area is unstable and would require cleaning if operations resume.	-
13+405	PC-2	1x600 mm CSP	In good condition	-
13+685	PC-3	1x600 mm CSP	In good condition	-
13+950	unnamed	1x600 mm CSP	In good condition	-
14+910	PC-4	1x600 mm CSP	In good condition	-
15+745	R-05A	1x1200 mm CSP	In good condition	-
17+600	R05 Center Bridge	30m Acrow Panel Bridge	In good condition. Minor damage to the bin wall of both abutments as a result of past snow removal activites. No reparation required yet.	228: north 229: south
18+280	PC-5	1x600 mm CSP	In good condition	-
18+900	PC-6	1x600 mm CSP	In good condition	-

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS	PHOTO
20+240	PC-7A	2x600 mm CSP	In general good condition. The outlet of the northern culvert is damaged.	-
20+250	PC-7	1x600 mm CSP	The outlet of the culvert is damaged and to be cleaned.	-
23+100	R06 Center Bridge	30 m Acrow Panel Bridge	In good condition	230: north 231: south
23+700	Quarry 3		A crusher is installed in this quarry. The west wall is in good and stable condition, but would need additional cleaning locally.	-
25+900	R-07	1x1200 mm CSP	In good condition	-
29+420	PC-8	1x600 mm CSP	In good condition	-
31+300	Quarry 4		Quarry flooded. In good condition.	-
34+650	Quarry 5		Rock walls are in good and stable condition, except for a small portion on the east side.	-
35+690	PC-9	1x600 mm CSP	In good condition.	-
36+470	Quarry 6		The remaining rock walls are clean and stable.	-

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS	PHOTO
36+865	PC-10	1x600 mm CSP	In good condition.	-
39+552	PC-11	1x600 mm CSP	In good condition. The inlet is too high and water is flowing underneath it. Not much flow observed in 2020.	Inlet: 232
39+800	Quarry 7		The quarry walls are in unstable condition with loose rocks. Scaling is recommended before resuming activities.	-
41+300	PC-12	1x600 mm CSP	In good condition, almost submerged.	-
42+950	Quarry 8		Walls are generally stabilized with rockfill berm but some others are in loose unstable condition (South wall).	195
44+600	Quarry 9		Presence of unstable loose rocks and boulders along the steepest and highest wall section. Some walls are in unstable condition with loose rocks.	194
48+500	R09 Center Bridge	12m Rapid Span Bridge	In good general condition. A series of cracks is present on top of the Southwest abutment (seems inactive).	233: north 235: south 234: southwest abutment
48+900	Quarry 10		The steep west rock wall is unstable.	-

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS	PHOTO
53+500	Quarry 11		Rock walls are clean and stable.	-
54+950	PC-16	1x600 mm CSP	Not observed in 2019	-
58+300	Quarry 12		In general good, stable condition.	-
62+060	R13 Center Bridge	12 m Rapid Span Bridge	In general good condition. The east side of the north abutment seemed inclined in the past but not anymore. The first railings steel pile at the Northwest abutment is partly ripped from the bridge.	236: north 237 : south
62+350	Quarry 13		Loose blocks were observed in some portions the the rock wall, but the quarry is in general good condition.	-
65+700	Quarry 14		Quarry flooded. Loose blocks were observed in some portions the the rock wall, but in general good condition.	193
67+600	Quarry 15		Steep rock wall in relatively stable condition. Quarry flooded.	-
67+840	R-14	3x1200 mm CSP	Middle and northern culverts show small sign of erosion at the outlet and have been damaged (collapsed) inside, below the road, but it is anticipated that they will continue to perform well. The South outlet is partly buried in gravel. All of them were installed too high but function well. Water is flowing under the road between the North and middle culverts, but no sign of erosion. No action required.	Outlet: 238

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS	PHOTO
69+200	R15 Centre Bridge	30 m Acrow Panel Bridge	Bin wall of both abutments were observed to be damaged but they are still holding well. The bridge is dipping toward the west side on both north and south abutments. The foundation does not show signs of failure but is slowly settling. Its condition should be monitored.	239 : north 240 : south
70+400	Quarry 16		Presence of unstable loose rocks and boulders but in general good condition.	-
72+800	Quarry 17		Steep rock wall in stable conditions.	-
73+800	R16 Centre Bridge	12m Rapid Span Bridge	In good condition. Flow observed under the North abutment, but no sign of erosion.	241: north 242: south
77+440	R-17	1x1200 mm CSP	In good condition	-
79+500	R18 Centre Bridge	12 m Rapid Span Bridge	In good condition. The middle steel panel on the bridge deck is broken and bent.	243: north 244: south
80+200	Quarry 18		In general good condition, south wall is high (about 8 m) with some loose blocks. The quarry was recently blasted and blasted materials are piled up in front of the unstable wall.	192
80+950	R-18A	3x1200 mm CSP	In good condition.	-
82+500	R-18B	1X600 mm CSP	In good condition, installed above ground surface (water can flow below culvert).	-

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS	PHOTO
83+150	R19 Centre	12m Rapid Span Bridge	Some damage to the steel containment plates and to one pile was observed, which may be associated with snow removal activity. The damage is minor and does not affect the geotechnical integrity of the bridge. Minor tension cracks in the top surface on the North abutment (both sides), they seem inactive. To monitor.	245: north 246: south
84+300	Quarry 19		Rock walls are in good condition.	-
85+490	R-20	1x1200 mm CSP	Outlet of the culvert is slighly twisted. The middle of the culvert is slightly collapsed. The inlet is installed above the ground surface and water is able to flow beneath the culvert. No follow-up required, in stable conditions.	-
87+300	R-21	2x1200 mm CSP	Both culverts are slightly collapsed in the middle. Should have been installed lower to avoid erosion issue. In stable condition.	-
89+550	Quarry 20		Quarry walls are in good condition	-
93+400	Quarry 21		Quarry walls are in good condition.	-
93+600	R-23	1x1200 mm CSP	Minor damage near the top, but still in good condition. The culvert is installed too high and as a result there is a low flow of water through the road rockfill. The situation has been under control over the past years.	-
98+100	R-24	2x1200 mm CSP	Both outlet are installed too high. The outlet of the southern culvert still shows small signs of erosion, but this has been under control over the past years. Both culvert show deformation in the upper part.	-

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS	PHOTO
99+200	Quarry 22		In relative stable condition.	-
101+950	R-25	2x600 mm CSP	One culvert is angling up toward the downstream end and natural drainage by gravity does not occur. A second culvert alongside is well installed and should drain water for the remainder of the season. No sign of erosion observed during the inspection.	-
104+400	R-26	3x1200 mm CSP	In good condition	-
	Quarry 23		This is an active quarry used to store rock cores and other things. Because of the presence of loose rocks on top of steep wall, the workers who need access to the quarry should be aware of rockfall potential and stay at a minimum of 20 m away from the wall. Most of the unstable wall areas are bermed off. Areas of the quarry are flooded.	-
	Culvert along Western Diversion Ditch	2x1200 mm CSP	Outlet in good condition and inlet slightly bent but still in good condition.	-

APPENDIX D2

Culverts Photographic Log



Photograph D2-1: PRC1 km 0+430

Date: July 17, 2020 **Photo Number**: 223

Description: View of the culvert outlet. Good condition.



Photograph D2-2: PRC2 km 0+470

Date: July 17, 2020 **Photo Number**: 224

Description: View of the culvert outlets. Good condition.



Photograph D2-3: PC-17A km 8+830

Date: July 17, 2020 **Photo Number**: 227

Description: View of the culvert outlets. No sign of degradation and the flow is stable south of the culverts (5-10 m away).



Photograph D2-4: PC-11 km 39+552

Date: July 17, 2020 **Photo Number**: 232

Description: View of the culvert inlet. Installed high but in good condition.



Photograph D2-5: R-14 km 67+840

Date: July 17, 2020 **Photo Number**: 238

Description: View of the culvert outlets. Water is flowing beneath the road between the middle and northern culverts.

APPENDIX D3

Bridges Photographic Log



Photograph D3-1 Bridges 1 – R02 km 8+750

Date: July 17, 2020 **Photo Number**: 225

Description: Looking at the north abutment. The corrugated steel bin shows deformation under the weight of the bridge.



Photograph D3-2 Bridges 1 – R02 km 8+750

Date: July 17, 2020 **Photo Number**: 226

Description: Looking at the south abutment. The corrugated steel bin shows deformation under the weight of the bridge.



Photograph D3-3 Bridges 2 – R05 km 17+600

Date: July 17, 2020 **Photo Number**: 228

Description: Looking at the north abutment.



Photograph D3-4 Bridges 2 – R05 km 17+600

Date: July 17, 2020 **Photo Number**: 229

Description: Looking at the south abutment. Minor damage to the bin wall.



Photograph D3-5 Bridges 3 – R06 km 23+100

Date: July 17, 2020 **Photo Number**: 230

Description: Looking at the north abutment.



Photograph D3-6 Bridges 3 – R06 km 23+100

Date: July 17, 2020 **Photo Number**: 231

Description: Looking at the south abutment.



Photograph D3-7 Bridges 4 – R09 km 48+500

Date: July 17, 2020 **Photo Number**: 233

Description: Looking at the north abutment.



Photograph D3-8 Bridges 4 – R09 km 48+500

Date: July 17, 2020 **Photo Number**: 234

Description: Looking at the southwest abutment. Small tension cracks are present in the surface.



Photograph D3-9 Bridges 4 – R09 km 48+500

Date: July 17, 2020 **Photo Number**: 235

Description: Looking at the south abutment.



Photograph D3-10 Bridges 5 – R13 km 62+060

Date: July 17, 2020 **Photo Number**: 236

Description: Looking at the north abutment.



Photograph D3-11 Bridges 5 – R13 km 62+060

Date: July 17, 2020 **Photo Number**: 237

Description: Looking at the south abutment.



Photograph D3-12 Bridges 6 – R15 km 69+200

Date: July 17, 2020 **Photo Number**: 239

Description: Looking at the north abutment. Damage to the bin wall likely caused during snow removal activities. Bridge is tipping toward the west side on the abutment.



Photograph D3-13 Bridges 6 – R15 km 69+200

Date: July 17, 2020 **Photo Number**: 240

Description: Looking at the south abutment. Damage to the bin wall likely caused during snow removal activities. Bridge is tipping toward the west side on the abutment.



Photograph D3-14 Bridges 7 – R16 km 73+800

Date: July 17, 2020 **Photo Number**: 241

Description: Looking at the north abutment. In good condition.



Photograph D3-15 Bridges 7 – R16 km 73+800

Date: July 17, 2020 **Photo Number**: 242

Description: Looking at the south abutment. In good condition.



Photograph D3-16 Bridges 8 – R18 km 79+500

Date: July 17, 2020 **Photo Number**: 243

Description: Looking at the north abutment. In good condition.



Photograph D3-17 Bridges 8 – R18 km 79+500

Date: July 17, 2020 **Photo Number**: 244

Description: Looking at the south abutment. In good condition.



Photograph D3-18 Bridges 9 – R19 km 83+150

Date: July 17, 2020 **Photo Number**: 245

Description: Looking at the north abutment. Minor damage to steel plate due to snow removal activity.



Photograph D3-19 Bridges 9 – R19 km 83+150

Date: July 17, 2020 **Photo Number**: 246

Description: Looking at the south abutment. Minor damage to steel plate due to snow removal activity. Minor tension cracks, seem inactive.

APPENDIX E

Whale Tail Project Road

APPENDIX E1

Whale Tail Project Road Observations

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS (2020)	Photo
116+449	#1	450 mm	Not observed, seems to be under Vault Pad.	-
116+675	#2	300 mm		-
117+133	#3	900 mm	In good condition.	-
117+137	#3-2	900 mm		
117+325	#4	800 mm	Not observed.	-
117+525	#5	600 mm	In good condition but inlet buried.	-
117+799	#6	600 mm	Not observed.	-
118+013	#7	900 mm	Inlet in good condition, outlet totally buried.	-
118+016	#7-2	900 mm		
118+125	#8	900 mm	In good condition.	-
118+127	#8-2	900 mm		
118+659	#9	600 mm	Inlet in good condition, outlet damaged and pinched.	-
119+400	Bridge 3.4		In good condition.	166: south 165: north
119+264	#10	600 mm	Inlet in good condition, outlet damaged and pinched.	-
119+850	#11	300 mm	In good condition.	-
120+183	#12	900 mm	In good condition.	-
120+181	#12-2	900 mm		
120+179	#12-3	900 mm		
120+184	#12-4	900 mm		
120+186	#12-5	900 mm		
120+615	#13	300 mm	Inlet in good condition, outlet not observed as it is buried.	-

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS (2020)	Photo
120+756	#14	600 mm	In good condition.	-
120+850	#15	900 mm	Not observed.	-
121+050	#16	300 mm	Not observed.	-
121+161	#17	800 mm	In good condition, outlet damaged.	-
121+330	#18	700 mm	In good condition.	-
121+574	#19	900 mm	In good condition.	-
121+931	#20	900 mm	In good condition.	-
121+929	#20-2	900 mm		
122+310	#21	300 mm	Not observed.	-
122+423	#22	600 mm	In good condition.	-
122+442	#23	600 mm	In good condition.	-
122+493	#24	600 mm	Not observed.	-
122+530	#25	600 mm	In good condition.	-
123+216	#26	800 mm	In good condition.	-
123+218	#26-2	800 mm		
123+275	#27	600 mm	In good condition.	-
123+300	#27-2	600 mm	Outlet is buried.	
123+325	#27-3	600 mm	In good condition.	-
123+349	#28	600 mm	In good condition.	-
123+375	#28-2	600 mm	In good condition.	-
123+779	#29	900 mm	Not observed.	-
123+781	#29-2	900 mm	Not observed.	-

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS (2020)	Photo
123+968	#30	900 mm	Not observed.	-
123+970	#30-2	900 mm		
124+005	#31	900 mm	Not observed.	-
124+383	#32	900 mm	Not observed.	-
124+405	#33	900 mm	In good condition.	-
124+426	#34	900 mm	In good condition.	-
124+428	#34-2	900 mm		
124+581	#35	700 mm	In good condition.	-
125+000	#36	700 mm	In good condition.	-
125+035	#37	900 mm	In good condition.	-
125+049	#38	900 mm	In good condition.	-
125+193	#39	900 mm	In good condition.	-
125+195	#39-2	900 mm		
125+291	#40	900 mm	In good condition.	-
125+388	#41	600 mm	In good condition.	-
125+416	#42	600 mm	In good condition.	-
125+460	#43	600 mm	Not observed.	-
125+490	#44	300 mm	Not observed.	-
125+710	#45	600 mm	Inlet is buried.	-
126+500	Quarry 10.5		Unstable wall, loose rocks. Workers should stay away from the wall.	-
126+700	Bridge 10.7	600 mm	In good condition.	168: south 167: north

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS (2020)	Photo
127+020	#46	900 mm	In good condition.	-
127+101	#47	900 mm	In good condition.	-
127+103	#47-2	900 mm		
127+104	unnamed	1000 mm		
127+105	#47-3	900 mm		
127+107	#47-4	900 mm		
127+203	#48	900 mm	The inlet is 3/4 buried.	-
127+411	#49	450 mm	Not observed.	-
127+748	#50	600 mm	In good condition.	-
127+905	#51	300 mm	Not observed.	-
128+195	#52	700 mm	In good condition.	-
128+240	#53	700 mm	In good condition.	-
128+388	#54	600 mm	Inlet is buried.	-
128+440	#55	600 mm	Inlet is buried.	-
128+485	#56	600 mm	In good condition.	-
128+635	#57	450 mm	In good condition.	-
128+740	#58	900 mm	In good condition.	-
128+760	#59	900 mm	Not observed.	-
128+775	#60	900 mm	Not observed.	-
129+050	#61	600 mm	Inlet in good condition.	-
129+265	#62	600 mm	In good condition.	-
129+390	#63	300 mm	In good condition.	-

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS (2020)	Photo
129+920	#64	600 mm	In good condition but inlet is buried.	-
130+924	#65	800 mm	In good condition but inlet is buried.	-
132+000	Bridge 16		In good condition.	170: south 169: north
132+324	#66	600 mm	In good condition but inlet is buried.	-
132+689	#67	600 mm	Not observed.	-
132+750	#68	600 mm	In good condition.	-
133+000	Esker #1		Active (gravel and rock). Presence of loose rock on the steep wall, risk of sloughing.	-
133+250	#68-A	600 mm	In good condition.	-
133+500	#68-B	600 mm	Not observed.	-
133+784	#69	600 mm	Not observed.	-
133+837	#70	600 mm	In good condition.	-
134+580	#73	1200 mm	In good condition.	-
134+559	#74	900 mm	In good condition.	-
134+610	#74-2	900 mm		
134+861	#75	600 mm	In good condition.	-
134+916	#76	450 mm	In good condition.	-
134+998	#77	450 mm	Not observed.	-
135+092	#78	300 mm	Not observed.	-
135+092	#78-2	300 mm		
135+495	#79	700 mm	In good condition.	-
135+659	#80	450 mm	In good condition.	-

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS (2020)	Photo
135+841	#81	600 mm	In good condition.	-
136+000	Bridge 20		In good condition.	172: south 171: north
136+143	#82	300 mm	Not observed.	-
136+300	#83	600 mm	Inlet is bent, still working.	-
136+527	#84	700 mm	In good condition.	-
136+671	#85	600 mm	Inlet in good condition, outlet is buried.	-
136+740	#86	600 mm	In good condition but outlet buried.	-
136+810	#87	600 mm	In good condition.	-
136+881	#88	300 mm	In good condition, the outlet is almost completely blocked.	-
	Quarry 21 (Q141)		Not inspected.	-
137+180	#89	450 mm	In good condition, the outlet is high above ground.	-
137+295	#90	800 mm	In good condition.	-
137+297	#90-2	800 mm		
137+770	#91	600 mm	In good condition.	-
137+040	#92	600 mm	In good condition.	-
138+100	#93	450 mm	Inlet in good condition, outlet totally buried.	-
138+147	#94	900 mm	In good condition.	-
138+149	#94-2	900 mm	In good condition.	-
138+150	#94-3	900 mm	In good condition.	-
138+161	#95	900 mm	In good condition.	-

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS (2020)	Photo
138+162	#95-2	900 mm	In good condition.	-
138+353	#96	600 mm	In good condition.	-
138+436	#97	600 mm	In good condition, the inlet is buried by rockfill.	-
138+482	#98	600 mm	In good condition.	-
138+830	#99	600 mm	In good condition.	-
138+936	#100	600 mm	In good condition.	-
139+025	#101	600 mm	Outlet in good condition, inlet totally buried.	-
139+265	#102	600 mm	In good condition.	-
139+562	#103	600 mm	In good condition.	-
139+595	#104	600 mm	In good condition.	-
139+900	Bridge 23.9		In good condition.	174: south 173: north
140+555	#105	600 mm	In good condition but outlet buried.	-
140+700	#106	600 mm	In good condition.	-
140+961	#107	900 mm	In good condition.	-
140+982	#107-2	900 mm		
140+984	#107-3	900 mm		
141+000	Esker #2		In general good condition, but the small walls are steep and in loose conditions. Risk of rockfalls near the walls.	-
141+551	#108	600 mm	In good condition.	-
141+905	#109	800 mm	In good condition.	-
142+100	Bridge 26.1		In good condition.	176: south 175: north

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS (2020)	Photo
142+350	#110	450 mm	Not observed.	-
142+461	#111	300 mm	In good condition.	-
142+630	#112	300 mm	In good condition but inlet totally buried.	-
142+736	#113	450 mm	In good condition but inlet is buried.	-
142+810	#114	450 mm	In good condition.	-
142+865	#115	300 mm	In good condition but outlet is buried.	-
142+940	#116	450 mm	In good condition but outlet is buried.	-
143+173	#117	700 mm	In good condition.	-
143+433	#118	450 mm	In good condition but inlet is half blocked.	-
143+777	#119	300 mm	In good condition.	-
144+125	#120	300 mm	In good condition.	-
144+300	#121	900 mm	In good condition.	-
144+302	#121-2	900 mm		
144+304	#121-3	900 mm		
144+414	#122	900 mm	In good condition.	-
144+416	#122-2	900 mm		
144+418	#122-3	900 mm		
144+575	#123	800 mm	Not observed.	-
144+710	#124	300 mm	In good condition.	-
145+040	#125	800 mm	In good condition.	-
145+240	#126	800 mm	Installed oblique to the road, but in good condition.	-
146+409	#129	1200 mm	In good condition.	-

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS (2020)	Photo
146+180	Quarry 30.5		The quarry was cleaned and is in good condition. Some walls still show some loose blocks.	
	30+540	600 mm	Not observed.	-
146+812	#130	600 mm	In good condition.	-
147+041	#131	600 mm	In good condition.	-
147+540	#132	600 mm	In good condition.	-
148+141	#133	300 mm	In good condition but inlet is buried.	-
148+300	Bridge 32.3		In good condition.	178: south 177: north
148+389	#134	300 mm	Not observed.	-
148+567	#135	300 mm	In good condition.	-
148+905	#136	300 mm	Not observed.	-
148+940	#137	300 mm	Not observed.	-
149+000	#138	300 mm	In good condition but inlet is buried.	-
149+214	#139	900 mm	In good condition.	-
149+216	#139-2	900 mm		
149+218	#139-3	900 mm		
149+256	#140	900 mm	In good condition.	-
149+258	#140-2	900 mm		
149+260	#140-3	900 mm		
149+727	#141	900 mm	In good condition.	-
149+728	#141-2	900 mm		
149+730	#141-3	900 mm		

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS (2020)	Photo
149+732	#141-4	900 mm		
149+734	#141-5	900 mm		
150+160	#142	450 mm	In good condition.	-
150+291	#143	600 mm	In good condition.	-
150+319	#144	1000 mm	In good condition.	-
150+395	#145	300 mm	Not observed.	-
150+660	#146	1200 mm	In good condition.	-
150+855	#147	600 mm	In good condition.	-
151+173	#148	600 mm	In good condition.	-
151+000	Rock quarry 35 (Q150)		Active quarry. In general good condition but the western wall (4-5 m high) is in unstable condition.	-
151+670	#149	900 mm	In good condition.	-
152+171	#150	900 mm	In good condition but 2 outlets are buried.	-
152+173	#150-2	900 mm		
152+175	#150-3	900 mm		
152+177	#150-4	900 mm		
152+179	#150-5	900 mm		
152+562	#151	600 mm	Not observed.	-
152+933	#152	900 mm	In good condition.	-
153+027	#153	600 mm	In good condition.	-
153+028	#153-2	600 mm		-
153+030	#153-3	600 mm		-

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS (2020)	Photo
153+032	#153-4	600 mm		-
153+033	#153-5	600 mm		-
153+261	#154	450 mm	In good condition.	-
153+470	#155	600 mm	In good condition.	-
153+506	#156	450 mm	In good condition.	-
154+028	#157	600 mm	In good condition.	-
154+490	#158	900 mm	In good condition.	-
154+491	#158-2	900 mm		
154+493	#158-3	900 mm		
155+768	#159	700 mm	Not observed.	-
155+966	#160	600 mm	In good condition but outled is buried.	-
156+051	#161	600 mm	In good condition.	-
156+238	#162	600 mm	Not observed.	-
156+474	#163	300 mm	Not observed.	-
156+790	#164	300 mm	In good condition.	-
156+964	#165	600 mm	In good condition.	-
157+610	#166	900 mm	In good condition.	-
157+843	#167	900 mm	Not observed.	-
158+342	#168	600 mm	In good condition.	-
158+765	#169	300 mm	In good condition.	-
159+340	#170	800 mm	In good condition.	-

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS (2020)	Photo
159+500	Bridge 43.5		In good condition.	181: south 180: north
159+568	#170-A	900 mm	In good condition.	-
159+577	#170-B	900 mm		
159+587	#170-C	900 mm		
159+815	#171	600 mm	In good condition.	-
160+431	#173	1000 mm	In good condition. The 2 southern culverts are installed below ground surface and water is flowing.	-
160+433	#173-2	1000 mm		
160+435	#173-3	1000 mm		
160+470	#174	600 mm	Not observed.	-
160+640	#175	450 mm	In good condition.	-
160+800	Bridge 44.8		The crack is present on the north-west concrete abutment, near the top and close to the road, appears stable since it was first observed in 2019.	183: south 182: north
161+055	#176	600 mm	Not observed.	-
161+065	#177	600 mm	In good condition.	-
161+170	#178	600 mm	In good condition.	-
161+485	#179	700 mm	In good condition.	-
161+803	#180	600 mm	In good condition.	-
161+935	#181	600 mm	In good condition.	-
162+000	Esker #3		Not active. The slopes appear stable.	-

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS (2020)	Photo
162+126	#182	800 mm	In good condition.	-
162+185	#183	800 mm	In good condition.	-
162+187	#183-2	800 mm	In good condition.	-
162+230	#184	600 mm	In good condition.	-
162+404	#185	300 mm	In good condition.	-
162+541	#186	450 mm	In good condition.	-
162+570	#187	600 mm	In good condition.	-
162+595	#188	600 mm	In good condition.	-
162+870	#189	700 mm	In good condition.	-
162+985	#190	900 mm	In good condition.	-
163+046	#191	300 mm	Not observed.	-
163+190	#192	600 mm	In good condition but outlet is buried.	-
163+360	#193	600 mm	In good condition.	-
163+660	#194	600 mm	In good condition.	-
163+808	#195	700 mm	Inlet extremity is torn off, but culvert is still in good condition.	-
163+961	#196	300 mm	In good condition.	-
164+120	#197	600 mm	In good condition.	-
164+222	#198	450 mm	In good condition.	-
164+383	#199	900 mm	In good condition. Water is flowing below the culverts. No sign of erosion.	-
164+385	#199-2	900 mm		
164+387	#199-3	900 mm		

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS (2020)	Photo
164+389	#199-4	900 mm		
164+457	#201	900 mm	Installed below the ground level.	-
164+800	#203	600 mm	In good condition.	-
164+840	#204	600 mm	In good condition.	-
165+108	#206	450 mm	In good condition.	-
165+310	#207	600 mm	In good condition.	-
165+431	#208	900 mm	In good condition.	-
165+433	#209	900 mm	In good condition.	
165+435	#210	900 mm	In good condition.	
165+550	#211	450 mm	In good condition.	-
165+640	#212	600 mm	In good condition.	-
165+795	#213	300 mm	Not observed.	-
165+915	#214	800 mm	In good condition.	-
166+135	#215	300 mm	In good condition.	-
166+510	#216	600 mm	Not observed.	-
166+600	Quarry Q165		In good condition.	-
166+790	#217	450 mm	In good condition.	-
167+233	#218	900 mm	In good condition.	-
167+235	#218-2	900 mm		
167+237	#218-3	900 mm		
167+239	#218-4	900 mm		
167+460	#219	300 mm	In good condition.	-

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS (2020)	Photo
167+883	#221	900 mm	In good condition.	-
167+885	#221-2	900 mm		
167+887	#221-3	900 mm		
168+000	Rock quarry 52		Active. In good and clean condition, partially flooded. The northern wall may pose a rockfall hazard (loose blocks and cobbles) which workers need to be aware of.	-
168+315	#222	600 mm	In good condition.	-
168+650	#223	600 mm	In good condition.	-
168+705	#224	600 mm	In good condition.	-
168+715	#225	450 mm	In good condition.	-
168+935	#226	700 mm	In good condition.	-
168+937	#226-2	450 mm		
168+970	#227	600 mm	In good condition.	-
168+995	#228	700 mm	In good condition.	-
169+245	#229	300 mm	In good condition.	-
169+363	#230	700 mm	In good condition.	-
169+659	#231	300 mm	Not observed.	-
169+928	#232	300 mm	In good condition.	-
170+240	#233	450 mm	In good condition.	-
170+385	#234	450 mm	In good condition but outlet is buried.	-
170+500	#235	600 mm	In good condition.	-
170+625	#236	450 mm	In good condition.	-
170+655	#237	600 mm	In good condition.	-

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS (2020)	Photo
170+850	#238	600 mm	In good condition.	-
171+060	#239	600 mm	In good condition.	-
171+164	#240	600 mm	In good condition.	-
171+235	#241	600 mm	Outlet in good condition but inlet buried.	-
171+329	#242	600 mm	In good condition.	-
171+593	#243	600 mm	Outlet in good condition but inlet is damaged and obstructed.	-
171+625	#244	450 mm	In good condition.	-
171+735	#245	600 mm	Not observed.	-
172+005	#246	600 mm	In good condition.	-
172+065	#247	700 mm	In good condition.	-
172+220	#248	700 mm	In good condition.	-
172+435	#249	600 mm	In good condition.	-
172+610	#250	800 mm	In good condition.	-
172+745	#251	300 mm	In good condition.	-
172+900	#252	900 mm	In good condition.	-
172+965	#253	900 mm	In good condition.	-
172+967	#253-2	900 mm	In good condition.	-
172+969	#253-3	900 mm	In good condition.	-
173+125	#254	600 mm	In good condition.	-
173+195	#255	600 mm	In good condition.	-
173+350	#256	600 mm	In good condition.	-
173+525	#257	600 mm	Not observed.	-

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS (2020)	Photo
173+875	#258	600 mm	Not observed.	-
173+985	#259	900 mm	In good condition.	-
174+185	#260	300 mm	In good condition.	-
174+350	#261	450 mm	In good condition.	-
174+410	#262	450 mm	In good condition.	-
174+885	#263	450 mm	In good condition.	-
174+922	#264	600 mm	In good condition.	-
174+967	#265	450 mm	In good condition.	-
175+024	#266	300 mm	In good condition.	-
175+720	Esker #5		Active (gravel). In good condition.	-
175+720	#267	900 mm	In good condition.	-
175+774	#268	600 mm	In good condition but inlet is buried.	-
175+860	#269	600 mm	In good condition.	-
176+000	#270	600 mm	In good condition.	-
176+050	#271	600 mm	In good condition.	
176+087	#272	600 mm	In good condition.	
176+649	#273	300 mm	In good condition.	-
176+815	#274	600 mm	In good condition.	-
177+022	#275	600 mm	In good condition.	-
177+170			Added pipe to drain area of accumulated water. This is a good practice.	-

STATION	NAME	STRUCTURE DESCRIPTION	COMMENTS (2020)	Photo
177+282	#276	600 mm	In good condition.	
177+622	#277	450 mm	In good condition.	-
177+870	#278	1200 mm	In good condition.	-
178+307	#279	300 mm	In good condition.	-
178+416	#280	900 mm	In good condition.	-
178+350	#281	600 mm	In good condition.	-
178+500	Esker #6		In good condition.	-
	Esker #7		Not observed. Possible not yet developed.	-
178+965	#283	450 mm	Outlet in good condition but inlet is buried.	-
179+070	#284	900 mm	In good condition.	-
179+072	#284-2	900 mm		
179+074	#284-3	900 mm		
179+429	#287	600 mm	Not observed.	-
179+530	#288	600 mm	In good condition.	-
179+733	#289	600 mm	Deformed but still in good condition.	-
179+900	unnamed		Set of 4 culverts installed below ground level for fish. Water is flowing in the 2 middle culverts. Pipe present in one of the culverts.	-
179+975	#290	600 mm	Not observed.	-

APPENDIX E2

Culverts Photographic Log



Photograph E2-1: East shoulder, km 174+670

Date: July 15, 2020 **Photo Number**: 184

Description: Surface of road damaged by grading activities and erosion around boulders (100-150 mm holes).



Photograph E2-2: West shoulder, km 177+050

Date: July 15, 2020 **Photo Number**: 185

Description: Erosion and sloughing of the west shoulder due to wash-out of material by run-off water. Note the sandy material deposited at the toe of the slope.



Photograph E2-3: West shoulder, km 177+050

Date: July 15, 2020 **Photo Number**: 186

Description: Erosion and sloughing of the west shoulder due to wash-out of material by run-off water.



Photograph E2-4: East shoulder, km 177+200

Date: July 15, 2020 **Photo Number**: 187

Description: Settlement of the east shoulder over about 150 m.



Photograph E2-5: West shoulder, km 177+700

Date: July 15, 2020 **Photo Number**: 188

Description: Erosion and sloughing of the west shoulder due to wash-out of material by run-off water.



Photograph E2-6: West shoulder, km 177+700

Date: July 15, 2020 **Photo Number**: 189

Description: Erosion and sloughing of the west shoulder due to wash-out of material by run-off water. Note the sandy material deposited at the toe of the slope.

APPENDIX E3

Bridges Photographic Log



Photograph E3-1 Bridges 1 – km 119+400

Date: July 15, 2020 **Photo Number**: 165

Description: Looking at the north abutment.



Photograph E3-2 Bridges 1 – km 119+400

Date: July 15, 2020 **Photo Number**: 166

Description: Looking at the south abutment.



Photograph E3-3 Bridges 2 – km 126+700

Date: July 15, 2020 **Photo Number**: 167

Description: Looking at the north abutment.



Photograph E3-4 Bridges 2 – km 126+700

Date: July 15, 2020 **Photo Number**: 168

Description: Looking at the south abutment.



Photograph E3-5 Bridges 3 – km 132+000

Date: July 15, 2020 **Photo Number**: 169

Description: Looking at the north abutment.



Photograph E3-6 Bridges 3 – km 132+000

Date: July 15, 2020 **Photo Number**: 170

Description: Looking at the south abutment.



Photograph E3-7 Bridges 4 – km 136+000

Date: July 15, 2020 **Photo Number**: 171

Description: Looking at the north abutment.



Photograph E3-8 Bridges 4 – km 136+000

Date: July 15, 2020 **Photo Number**: 172

Description: Looking at the south abutment.



Photograph E3-9 Bridges 5 – km 139+900

Date: July 15, 2020 **Photo Number**: 173

Description: Looking at the north abutment.



Photograph E3-10 Bridges 5 – km 139+900

Date: July 15, 2020 **Photo Number**: 174

Description: Looking at the south abutment.



Photograph E3-11 Bridges 6 – km 142+100

Date: July 15, 2020 **Photo Number**: 175

Description: Looking at the north.



Photograph E3-12 Bridges 6 – km 142+100

Date: July 15, 2020 **Photo Number**: 176

Description: Looking at the south abutment.



Photograph E3-13 Bridges 7 – km 148+300

Date: July 15, 2020 **Photo Number**: 177

Description: Looking at the north abutment.



Photograph E3-14 Bridges 7 – km 148+300

Date: July 15, 2020 **Photo Number**: 178

Description: Looking at the south abutment.



Photograph E3-15 Bridges 8 – km 159+500

Date: July 15, 2020 **Photo Number**: 180

Description: Looking at the north abutment.



Photograph E3-16 Bridges 8 – km 159+500

Date: July 15, 2020 **Photo Number**: 181

Description: Looking at the south abutment.



Photograph E3-17 Bridges 9 – km 160+800

Date: July 15, 2020 **Photo Number**: 182

Description: Looking at the north abutment. A crack is present in the concrete on the western side.



Photograph E3-18 Bridges 9 – km 160+800

Date: July 15, 2020 **Photo Number**: 183

Description: Looking at the south abutment.

APPENDIX F

Quarries



Photograph F-1: Quarry 8 – km 42+950

Date: July 17, 2020 **Photo Number**: 195

Description: View of south wall. Presence of loose blocks.



Photograph F-2: Quarry 9 – km 44+600

Date: July 17, 2020 **Photo Number**: 194

Description: View of north wall. Presence of loose blocks at the base of the wall.



Photograph F-3: Quarry 14 – km 65+700

Date: July 17, 2020 **Photo Number**: 193

Description: View of north and west walls. Quarry flooded.



Photograph F-4: Quarry 18 – km 80+200

Date: July 17, 2020 **Photo Number**: 192

Description: View of the south wall. In general good condition, south wall is high (about 8 m) with some loose blocks. Recent blasting operations and pile of blasted material in front of the south wall.

APPENDIX G

Bulk Fuel Facilities

APPENDIX G1

Baker Lake Tank Farm Photographic Log



Photograph G1-1 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 201

Description: From the south side of Tank 1, looking southeast at Tanks 1, 2, 3, and 4. Presence of water ponding.



Photograph G1-2 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 202

Description: Looking at the southwestern corner of Tank 1. Presence of water ponding.



Photograph G1-3 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 200

Description: Looking northwest toward the south side of Tank 1.



Photograph G1-4 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 199

Description: Looking northeast toward the south side of Tanks 2 and 3. Presence of water ponding and animal burrow as well as exposed geosynthetics in the slope at the high-water line.



Photograph G1-5 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 198

Description: Looking southwest toward the south wall of the tank farm. Presence of water ponding and animal burrow as well as exposed geosynthetics in the slope at the high water line.



Photograph G1-6 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**:204

Description: Looking southwest. Presence of water ponding and animal burrow as well as exposed geosynthetics in the slope at the high-water line.



Photograph G1-7 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 203

Description: From the southwestern corner of Tank 3 looking southeast. View of exposed geosynthetics and erosion feature in the slope caused by run-off from the crest.



Photograph G1-8 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 205

Description: From the south portion of the site looking northwest at the south side of Tank 3 and 4.



Photograph G1-9 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 206

Description: From the south portion of the site looking northeast.



Photograph G1-10 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 208

Description: From the northeastern corner of Tank 4 looking southwest.



Photograph G1-11 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 209

Description: From the northern side of Tank 4, looking northwest toward Tanks 4, 3, 2, and 1. Presence of exposed liner due to erosion of the granular cover.



Photograph G1-12 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 197

Description: From the northeastern corner of Tank 2 looking northwest towards the northeastern side of Tanks 1 and 2.



Photograph G1-13 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 196

Description: From the northwestern corner of Tank 3 looking southeast towards the northeastern side of Tanks 3 and 4.



Photograph G1-14 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 212

Description: Looking northwest at the southern and western sides of Tank 5.



Photograph G1-15 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 211

Description: Looking north between Tanks 5 and 6.



Photograph G1-16 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 213

Description: Looking northeast at the southern side of Tank 6. Presence of water ponding.



Photograph G1-17 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 215

Description: Looking southeast at the northeastern side of Tank 6.



Photograph G1-18 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 214

Description: Looking south between Tanks 5 and 6.



Photograph G1-19 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 216

Description: Looking northwest at the new tank that was constructed in winter 2020.



Photograph G1-20 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 217

Description: Looking west at the crest on the northeastern side of Tank 5. Presence of tension cracks (10 to 30 mm wide).



Photograph G1-21 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 218

Description: From the northeastern corner of the Jet A fuel tanks looking south. Presence of exposed geomembrane.



Photograph G1-22 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 219

Description: From the northeastern corner of the Jet A fuel tanks looking west. Presence of exposed geomembrane.



Photograph G1-23 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 221

Description: From the southwestern corner of the Jet A fuel tanks looking east. Presence of exposed geomembrane and water ponding.



Photograph G1-24 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 222

Description: From the southwestern corner of the Jet A fuel tanks looking north. Presence of exposed geomembrane and water ponding.



Photograph G1-25 Baker Lake Tank Farm

Date: July 17, 2020 **Photo Number**: 220

Description: From the southwestern corner of the Jet A fuel tanks looking south. Hole (100 mm) in the geomembrane.

APPENDIX G2

Meadowbank Tank Farm Photographic Log



Photograph G2-1 Meadowbank Tank Farm

Date: July 14, 2020 **Photo Number**: 4

Description: From the western corner, looking southeast. Presence of water ponding.



Photograph G2-2 Meadowbank Tank Farm

Date: July 14, 2020 **Photo Number**: 3

Description: From the western corner, looking northeast. Presence of water ponding.



Photograph G2-3 Meadowbank Tank Farm

Date: July 14, 2020 **Photo Number**: 6

Description: Looking northeast from the southern corner. Accumulation of water in the eastern corner.



Photograph G2-4 Meadowbank Tank Farm

Date: July 14, 2020 **Photo Number**: 2

Description: Looking northwest from the southern corner. Presence of water ponding.



Photograph G2-5 Meadowbank Tank Farm

Date: July 14, 2020 **Photo Number**: 1

Description: Looking northwest from the western corner. Presence of water ponding.



Photograph G2-6 Meadowbank Tank Farm

Date: July 14, 2020 **Photo Number**: 5

Description: Looking southeast from the northeastern side of the tank. Presence of water ponding.

APPENDIX G3

Whale Tail Project Tank Farm Photographic Log



Photograph G3-4 Whale Tail Project Site Tank Farm

Date: July 20, 2020 **Photo Number**: 248

Description: From the fuelling pad, looking west at the Tank Farm. Presence of water ponding.



Photograph G3-5 Whale Tail Project Site Tank Farm

Date: July 20, 2020 **Photo Number**: 247

Description: From the fuelling pad, looking north at the Tank Farm. Presence of water ponding.



Photograph G3-7 Whale Tail Project Site Tank Farm

Date: July 20, 2020 **Photo Number**: 249

Description: From the northeast corner of the tank, looking west.



Photograph G3-8 Whale Tail Project Site Tank Farm

Date: July 20, 2020 **Photo Number**: 250

Description: From the northwest corner of the tank, looking east.



Photograph G3-8 Whale Tail Project Site Tank Farm

Date: July 20, 2020 **Photo Number**: 251

Description: From the northwest corner of the tank, looking south.



Photograph G3-8 Whale Tail Project Site Tank Farm

Date: July 20, 2020 **Photo Number**: 252

Description: From the southwest corner of the tank, looking northeast. Presence of oily water.

APPENDIX H

Other Facilities

APPENDIX H1

Vault Culverts Photographic Log



Photograph H1-1 Vault Road Culverts

Date: July 14, 2020 **Photo Number**: 69

Description: Looking at the outlet of the three culverts located on Vault Road at 640964E/7217466N. All of them are deformed in the middle.



Photograph H1-2 Vault Road Culverts

Date: July 14, 2020 **Photo Number**: 70

Description: From the inlet side of the three culverts located on Vault Road at 640964E/7217466N. The culverts are slightly deformed on top in the middle.

APPENDIX H2

Diversion Ditch Photographic Log



Photograph H2-1 Diversion Ditch and its Sediment and Erosion Protection Structure

Date: July 14, 2020 **Photo Number**: 79

Description: Looking east toward the inlet of the culverts beneath the road.



Photograph H2-2 Diversion Ditch and its Sediment and Erosion Protection Structure

Date: July 14, 2020 **Photo Number**: 78

Description: Looking west toward the outlet of the culverts beneath the road.



Photograph H2-3 Diversion Ditch and its Sediment and Erosion Protection Structure

Date: July 14, 2020 **Photo Number**: 83

Description: From the eastern diversion ditch looking south toward Lake NP2.



Photograph H2-4 Diversion Ditch and its Sediment and Erosion Protection Structure

Date: July 14, 2020 **Photo Number**: 84

Description: From the eastern diversion ditch looking northwest.



Photograph H2-5 Diversion Ditch and its Sediment and Erosion Protection Structure

Date: July 14, 2020 **Photo Number**: 85

Description: From the eastern diversion ditch, looking east.



Photograph H2-6 Diversion Ditch and its Sediment and Erosion Protection Structure

Date: July 14, 2020 **Photo Number**: 86

Description: From the eastern diversion ditch, looking northwest.



Photograph H2-7 Diversion Ditch and its Sediment and Erosion Protection Structure

Date: July 14, 2020 **Photo Number**: 87

Description: From the northern diversion ditch looking southeast.



Photograph H2-8 Diversion Ditch and its Sediment and Erosion Protection Structure

Date: July 14, 2020 **Photo Number**: 88

Description: From the northern diversion ditch looking west.



Photograph H2-9 Diversion Ditch and its Sediment and Erosion Protection Structure

Date: July 14, 2020 **Photo Number**: 89

From the northern diversion ditch looking east.



Photograph H2-10 Diversion Ditch and its Sediment and Erosion Protection Structure

Date: July 14, 2020 **Photo Number**: 90

From the northern diversion ditch looking west.



Photograph H2-11 Diversion Ditch and its Sediment and Erosion Protection Structure

Date: July 14, 2020 **Photo Number**: 91

Description: From the northern diversion ditch looking east.



Photograph H2-12 Diversion Ditch and its Sediment and Erosion Protection Structure

Date: July 14, 2020 **Photo Number**: 92

Description: From the northern diversion ditch looking west.



Photograph H2-13 Diversion Ditch and its Sediment and Erosion Protection Structure

Date: July 14, 2020 **Photo Number**: 93

Description: From 637281E/7216790N, looking north. View of the western diversion ditch.



Photograph H2-14 Diversion Ditch and its Sediment and Erosion Protection Structure

Date: July 14, 2020 **Photo Number**: 94

Description: From 637281E/7216790N, looking south at the western diversion ditch.



Photograph H2-15 Diversion Ditch and its Sediment and Erosion Protection Structure

Date: July 14, 2020 **Photo Number**: 95

Description: From 637251E/7216171N, looking north at the western diversion ditch.



Photograph H2-16 Diversion Ditch and its Sediment and Erosion Protection Structure

Date: July 14, 2020 **Photo Number**: 96

Description: From 637251E/7216171N, looking southwest at the western diversion ditch and its retention basin.



Photograph H2-17 Diversion Ditch and its Sediment and Erosion Protection Structure

Date: July 14, 2020 **Photo Number**: 97

Description: From 637074E/7216157N, looking east at the western diversion ditch.



Photograph H2-18 Diversion Ditch and its Sediment and Erosion Protection Structure

Date: July 14, 2020 **Photo Number**: 98

Description: From 637074E/7216157N, looking west at the western diversion ditch.

APPENDIX H3

RSF Till Plug Photographic Log



Photograph H3-1 RSF Till Plug

Date: July 14, 2020 **Photo Number**: 82

Description: From the south side of NP2 Lake (north of the diversion ditch) looking west at the RSF till plug.



Photograph H3-2 RSF Till Plug

Date: July 14, 2020 **Photo Number**: 81

Description: From the south side of NP2 Lake (south of the diversion ditch) looking west at the RSF till plug.



Photograph H3-3 RSF Till Plug

Date: July 14, 2020 **Photo Number**: 80

Description: From the south side of NP2 Lake (south of the diversion ditch) looking southeast at the RSF till plug.

APPENDIX H4

Landfill Photographic Log



Photograph H4-1 Landfill

Date: July 14, 2020 **Photo Number**: 123

Description: From the new landfill location within the Rock Storage Facility, looking southeast.

APPENDIX H5

Landfarm Photographic Log



Photograph H5-1 Contaminated Soil Storage and Bioremedial Landfarm Facility

Date: July 14, 2020 **Photo Number**: 121

Description: From the northeast extremity of the South Cell, looking southeast at the Contaminated Soil Storage and Bioremedial Landfarm Facility. Signs of superficial slope failure have disappeared.



Photograph H5-2 Contaminated Soil Storage and Bioremedial Landfarm Facility

Date: July 14, 2020 **Photo Number**: 122

Description: From the northeast extremity of the South Cell, looking northeast at the Contaminated Soil Storage and Bioremedial Landfarm Facility. Signs of superficial slope failure are disappearing.

APPENDIX H6

Crusher Retaining Wall Photographic Log



Photograph H6-1 Crusher Retaining Wall

Date: July 16, 2020 **Photo Number**: 190

Description: From the base of the wall, looking south.



Photograph H6-2 Crusher Retaining Wall

Date: July 16, 2020 **Photo Number**: 191

Description: From the base of the retaining wall, looking east.

APPENDIX H7

Whale Tail Project
Attenuation Pond Ramp



Photograph H7-1 Whale Tail Project Site Attenuation Pond Ramp

Date: July 20, 2020 **Photo Number**: 303

Description: From the primary attenuation pond ramp above the pump pad, looking west at the attenuation pond.



Photograph H7-2 Whale Tail Project Site Attenuation Pond Ramp

Date: July 20, 2020 **Photo Number**: 304

Description: From the primary attenuation pond ramp above the pump pad, looking north at the secondary ramp.



Photograph H7-3 Whale Tail Project Site Attenuation Pond Ramp

Date: July 20, 2020 **Photo Number**: 305

Description: From the primary attenuation pond ramp above the pump pad, looking west at the southern slope of the ramp and the attenuation pond.



Photograph H7-4 Whale Tail Project Site Attenuation Pond Ramp

Date: July 20, 2020 **Photo Number**: 306

Description: From the primary attenuation pond ramp above the pump pad, looking east at the southern slope of the ramp.



Photograph H7-5 Whale Tail Project Site Attenuation Pond Ramp

Date: July 20, 2020 **Photo Number**: 307

Description: From the primary attenuation pond ramp above the pump pad, looking north at the secondary ramp.



Photograph H7-6 Whale Tail Project Site Attenuation Pond Ramp

Date: July 20, 2020 **Photo Number**: 308

Description: From the pump pad, looking northwest at the southern slope of the pump pad.



Photograph H7-7 Whale Tail Project Site Attenuation Pond Ramp

Date: July 20, 2020 **Photo Number**: 309

Description: From the pump pad, looking north at the western slope of the pump pad and the secondary attenuation pond ramp.



Photograph H7-8 Whale Tail Project Site Attenuation Pond Ramp

Date: July 20, 2020 **Photo Number**: 310

Description: From the pump pad, looking east at the pump pad and primary attenuation pond ramp.

APPENDIX H8

Whale Tail Project Diffuser



Photograph H8-1 Mammoth Lake Diffuser

Date: July 20, 2020 **Photo Number**: 262

Description: From the access road, looking west. Three diffusers are present and working normally.

APPENDIX H9

South Whale Tail Channel



Photograph H9-1 South Whale Tail Channel

Date: July 20, 2020 **Photo Number**: 261

Description: From the outlet into Mammoth Lake, looking northwest. Two turbidity barriers are deployed in the lake.



Photograph H9-2 South Whale Tail Channel

Date: July 20, 2020 **Photo Number**: 253

Description: From approx. Sta. 0+800, looking northwest.



Photograph H9-3 South Whale Tail Channel

Date: July 20, 2020 **Photo Number**: 254

Description: From approx. Sta. 0+675, looking southeast.



Photograph H9-4 South Whale Tail Channel

Date: July 20, 2020 **Photo Number**: 255

Description: From approx. Sta. 0+450 (Lake A45 area), looking northwest.



Photograph H9-5 South Whale Tail Channel

Date: July 20, 2020 **Photo Number**: 256

Description: From approx. Sta. 0+450 (Lake A45 area), looking southeast.



Photograph H9-6 South Whale Tail Channel

Date: July 20, 2020 **Photo Number**: 258

Description: From approx. Sta. 0+200, looking southeast.



Photograph H9-7 South Whale Tail Channel

Date: July 20, 2020 **Photo Number**: 259

Description: From the Whale Tail South Lake inlet, looking southwest. A ridge of riprap is present at the inlet, but water is flowing.



Photograph H9-8 South Whale Tail Channel

Date: July 20, 2020 **Photo Number**: 260

Description: From the Whale Tail South Lake inlet, looking north.

APPENDIX H10

Saline Ditch



Photograph H10-1 Saline Ditch

Date: July 20, 2020 **Photo Number**: 311

Description: From the northern extremity of the Saline Ditch, looking west. The culvert is in good condition.



Photograph H10-2 Saline Ditch

Date: July 20, 2020 **Photo Number**: 312

Description: From the northern extremity of the Saline Ditch, looking east.



Photograph H10-3 Saline Ditch

Date: July 20, 2020 **Photo Number**: 313

Description: From approx. Sta. 0+140, looking northwest. Presence of boulders in the ditch.



Photograph H10-4 Saline Ditch

Date: July 20, 2020 **Photo Number**: 314

Description: From approx. Sta. 0+140, looking southeast.



Photograph H10-5 Saline Ditch

Date: July 20, 2020 **Photo Number**: 315

Description: From approx. Sta. 0+410, looking north.



Photograph H10-6 Saline Ditch

Date: July 20, 2020 **Photo Number**: 316

Description: From approx. Sta. 0+440, looking west.



Photograph H10-7 Saline Ditch

Date: July 20, 2020 **Photo Number**: 317

Description: From approx. Sta. 0+530, looking east.



Photograph H10-8 Saline Ditch

Date: July 20, 2020 **Photo Number**: 318

Description: From approx. Sta. 0+530, looking north.



Photograph H10-9 Saline Ditch

Date: July 20, 2020 **Photo Number**: 319

Description: From approx. Sta. 0+560, looking west.



Photograph H10-10 Saline Ditch

Date: July 20, 2020 **Photo Number**: 320

Description: From the southwestern extremity of the Saline Ditch, looking east.



Photograph H10-11 Saline Ditch

Date: July 20, 2020 **Photo Number**: 321

Description: From the southwestern extremity of the Saline Ditch, looking northwest. The culvert is obstructed and water is ponding in the ditch.

APPENDIX H11

Whale Tail Project Site Roads



Photograph H11-1 Whale Tail Project Site Roads

Date: July 20, 2020 **Photo Number**: 257

Description: View of Road 24 adjacent to the South Whale Tail Channel. Numerous settlement features and cracks in the road surface.



Photograph H11-1 Whale Tail Project Site Roads

Date: July 21, 2020 **Photo Number**: 351

Description: View of Road 22 at the diffuser ramp intersection. Water is ponding on the southern side of the road and causes material washout when it overtops the road. A culvert should be installed at this location.

APPENDIX I

Dikes Details and Instrumentation

1.0 MEADOWBANK DEWATERING DIKES

1.1 East Dike

East Dike was constructed in the summer of 2008; grouting of the foundation and bedrock occurred in 2008 and during the first quarter of 2009.

Instrumentation has been installed within East Dike and includes piezometers, thermistors, inclinometers, and flow meters. Survey monuments were removed from East Dike in the past as they have never been used. The inclinometer at Sta. 60+195 was destroyed in the past and has not been replaced. Replacement of this instrument is not considered necessary; however, monitoring of East Dike should continue and, if anomalous conditions are observed, then replacing this inclinometer should be re-evaluated.

Instrumentation within East Dike was installed in the spring of 2009 to monitor the dike's performance following construction and during dewatering, operation, and into closure. Additional instrumentation was added in 2009 and 2010 to increase coverage across the dike. Since June 2012, all piezometers and thermistors on East Dike have been connected to an automatic data collection and transmission system (VDV database). The following subsections present a summary of the data collected between September 2017 and August 2018.

Instrumentation within East Dike was installed in the spring of 2009 to monitor the dike's performance following construction and during dewatering, operation, and into closure. Additional instrumentation was added in 2009 and 2010 to increase coverage across the dike. Since June 2012, all piezometers and thermistors on East Dike have been connected to an automatic data collection and transmission system (VDV database). Two inclinometers are installed on East Dike at Sta. 60+495 and 60+705. An inclinometer was installed at Sta. 60+195, but was destroyed in July 2010 and has not been replaced.

Table 1 and Table 2 below detail instrumentation on East Dike.

Table 1: List of Piezometers and Thermistors on East Dike (source: AEM)

Station	Instrument ID	Type	Status	Readings	For PZ		For TH	
#	ID	PZ/TH	Operational (✓)/Not operational (×) /Frozen (F)	Manual/ Automatic	Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
60+092	TH92	TH	✓	Automatic (DL8-SH1)	-	-	16	136/119
60+150	Pz150C	PZ	×(F)	Automatic (DL8-SH1)	127.35	Interface	-	-
60+185	TH185	TH	✓	Automatic (DL8-SH1)	-	-	16	136/119
60+190	Pz190P1A	PZ	✓	Automatic (DL8-SH1)	116.7	Bedrock	-	-
60+190	Pz190P1B	PZ	✓	Automatic (DL8-SH1)	121.7	Bedrock	-	-
60+190	Pz190P1C	PZ	✓	Automatic (DL8-SH1)	126.7	Interface	-	-
60+190	Pz190P2A	PZ	✓	Automatic (DL8-SH1)	116.34	Bedrock	-	-
60+190	Pz190P2B	PZ	✓	Automatic (DL8-SH1)	121.34	Bedrock	-	-
60+190	Pz190P2C	PZ	×(F)	Automatic (DL8-SH1)	126.34	Bedrock		
60+190	Pz190P3A	PZ	✓	Automatic (DL8-SH1)	116.63	Bedrock	-	-
60+190	Pz190P3B	PZ	✓	Automatic (DL8-SH1)	121.63	Bedrock	-	-
60+200	Pz200C	PZ	✓	Automatic (DL8-SH1)	127.71	Interface	-	-
60+240	Pz240C	PZ	✓	Automatic (DL8-SH1)	128.71	Interface	-	-
60+400	Pz400C	PZ	✓	Automatic (DL8-SH2)	126.76	Interface	-	-
60+420	Pz420C	PZ	✓	Automatic (DL8-SH2)	125.32	Interface	-	-
60+440	Pz440C	PZ	✓	Automatic (DL8-SH2)	124.66	Interface	-	-
60+450	Pz450C	PZ	✓	Automatic (DL8-SH2)	127	Interface	-	-
60+460	Pz460C	PZ	✓	Automatic (DL8-SH2)	125.15	Interface	-	-
60+470	Pz470C	PZ	×(F)	Automatic (DL8-SH2)	124.76	Interface	-	-

Station	Instrument ID	Type	Status	Readings	For PZ		For TH	
#	ID	PZ/TH	Operational (✓)/Not operational (×)	Manual/ Automatic	Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
60+472	Pz472C	PZ	✓	Automatic (DL8-SH2)	126.87	Interface+1M	-	-
60+480	Pz480C	PZ	✓	Automatic (DL8-SH2)	125.44	Interface	-	-
60+485	TH485	TH	✓	Automatic (DL8-SH2)	-	-	16	136/119
60+490	Pz490P1A	PZ	✓	Automatic (DL8-SH2)	114.12	Bedrock	-	-
60+490	Pz490P1B	PZ	✓	Automatic (DL8-SH2)	119.12	Bedrock	-	-
60+490	Pz490P1C	PZ	✓	Automatic (DL8-SH2)	125.81	Interface	-	-
60+490	Pz490P2A	PZ	✓	Automatic (DL8-SH2)	115.07	Bedrock	-	-
60+490	Pz490P2B	PZ	✓	Automatic (DL8-SH2)	120.07	Bedrock	-	-
60+490	Pz490P2C	PZ	✓	Automatic (DL8-SH2)	126.76	Interface	-	-
60+490	Pz490P3A	PZ	✓	Automatic (DL8-SH2)	114.62	Bedrock	-	-
60+490	Pz490P3B	PZ	✓	Automatic (DL8-SH2)	119.62	Bedrock	-	-
60+500	Pz500C	PZ	✓	Automatic (DL8-SH2)	125.78	Interface	-	-
60+510	Pz510C	PZ	✓	Automatic (DL8-SH2)	126.06	Interface	-	-
60+550	Pz550C	PZ	×(F)	Automatic (DL8-SH2)	129.85	Interface	-	-
60+600	Pz600C	PZ	×(F)	Automatic (DL8-SH3)	128.6	Interface	-	-
60+650	Pz650C	PZ	×(F)	Automatic (DL8-SH3)	128.48	Interface	-	-
60+695	TH695	TH	✓	Automatic (DL8-SH3)	-	-	16	136/119

Station	Instrument ID	Type	Status	Readings	For PZ		For TH	
#	ID	PZ/TH	Operational (✓)/Not operational (×)	Manual/ Automatic	Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
60+700	Pz700P2A	PZ	✓	Automatic (DL8-SH3)	118.08	Bedrock	-	-
60+700	Pz700P2B	PZ	✓	Automatic (DL8-SH3)	123.08	Bedrock	-	-
60+700	Pz700P2C	PZ	×(F)	Automatic (DL8-SH3)	129.77	Interface	-	-
60+700	Pz700P3A	PZ	✓	Automatic (DL8-SH3)	117.93	Bedrock	-	-
60+700	Pz700P3B	PZ	✓	Automatic (DL8-SH3)	122.93	Bedrock	-	-
60+750	Pz750C	PZ	×(F)	Automatic (DL8-SH3)	128.16	Interface	-	-
60+842	TH842	TH	✓	Automatic (DL8-SH3)	-	-	16	136/119

Table 2: Inclinometers on East Dike (source: AEM)

Location	Instrument ID	Operational (✓)/Not operational (×)	Manual/Automatic	Elevation interval in meters (top/bottom)
60+195	ED-IN-195	×(Damaged)	-	-
60+495	ED-IN-495	✓	Manual	136.6/124.1
60+705	ED-IN-705	✓	Manual	137.1/126.1

1.2 South Camp Dike

South Camp Dike was constructed between April and June of 2009. Additional thermal capping material and rockfill for the haul road was added to the dike in the winter of 2009-2010.

Table 3 below details instrumentation on South Camp Dike.

Table 3: List of Thermistors on South Camp Dike (source: AEM)

Hole	ID	Type	Status	Readings	For PZ		For TH	
#	ID	PZ/TH	Operational (✓)/Not operational (×)	Manual/ Automatic	Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
38-3	SC-09-A	TH	✓	Manual	-	-	16	133.03/110.03
38-5	SC-10	TH	✓	Manual	-	-	16	132.40/109.40

1.3 Bay-Goose Dike

Construction of Bay-Goose Dike started in the summer of 2009. The earthworks component for the northern portion of the dike was mostly completed by early October 2009 and by October 2010 for the southern portion.

Grouting of the foundation and bedrock occurred between March 2010 and July 2011. Jet grouting occurred in selected portions of the dike between October 2010 and May 2011. The first phase of dewatering Bay-Goose Basin was completed by mid-November 2011 and the second phase was completed in August 2012.

Instruments were installed on Bay-Goose Dike in the summer of 2011 to monitor the dike's performance following construction, during dewatering and operation, and into closure. Survey monuments were removed from Bay-Goose Dike as they have never been used. Additional boreholes have been drilled in the North Channel sector in 2017 to install TDR reflectometers and inclinometers in order to monitor the dike's reaction to nearby blasting in Pit E5.

Table 4, Table 5 and Table 6 below detail instrumentation on Bay-Goose Dike.

Table 4: List of Piezometers and Thermistors on Bay-Goose Dike (source: AEM)

Station #	Instrument ID ID	Type PZ/TH	Status Operational (✓)/Not operational (×)/Frozen (F)	Readings Manual/ Automatic	For PZ		For TH	
					Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in m (top/bottom)
30+134	T1	TH	✓	Automatic (DL1)	-	-	16	135/115
30+158	Pz01P1A	PZ	×(F)	-	-	-	-	-
30+158	Pz01P1B	PZ	×(F)	-	-	-	-	-
30+158	Pz01P1C	PZ	×(F)	-	-	-	-	-
30+158	Pz01P2A	PZ	✓	Automatic (DL1)	117.05	10m below bedrock	-	-
30+158	Pz01P2B	PZ	✓	Automatic (DL1)	122.05	5m below bedrock	-	-
30+158	Pz01P2C	PZ	×(F)	Automatic (DL1)	128.05	1m above bedrock	-	-
30+158	Pz01P3A	PZ	×	Automatic (DL1)	117.13	10m below bedrock	-	-
30+158	Pz01P3B	PZ	×	Automatic (DL1)	122.13	5m below bedrock	-	-
30+167	Pz06P2	PZ	×(F)	Automatic (DL1)	127.57	1m above bedrock	-	-
30+185	T2	TH	✓	Automatic (DL1)	-	-	16	135/115
30+249.5	Pz07P2	PZ	×(F)	Automatic (DL1)	129.85	1m above bedrock	-	-
30+260	T3	TH	✓	Automatic (DL1)	-	-	16	130/125.5
30+272	T4	TH	✓	Automatic (DL1)	-	-	16	130/125.5
30+276.5	Pz02P1A	PZ	×(F)	Automatic (DL1)	119.25	10m below bedrock	-	-
30+276.5	Pz02P1B	PZ	×(F)	Automatic (DL1)	124.25	5m below bedrock	-	-
30+276.5	Pz02P1C	PZ	×(F)	Automatic (DL1)	130.25	1m above bedrock	-	-
30+276.5	Pz02P2A	PZ	✓	Automatic (DL1)	119.1	10m below bedrock	-	-
30+276.5	Pz02P2B	PZ	×(F)	Automatic (DL1)	124.1	5m below bedrock	-	-
30+276.5	Pz02P2C	PZ	×	Automatic (DL1)	130.1	1m above bedrock	-	-
30+276.5	Pz02P3A	PZ	✓	Automatic (DL1)	119.7	10m below bedrock	-	-

Station	Instrument ID	Type	Status	Readings	For PZ		For TH	
#	ID	PZ/TH	Operational (✓)/Not operational (×)/ Frozen (F)	Manual/ Automatic	Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
30+276.5	Pz02P3-B	PZ	✓	Automatic (DL1)	124.7	5m below bedrock	-	-
30+288.5	T5	TH	✓	Automatic (DL1)	-	-	16	130/125.5
30+306.5	Pz08P2	PZ	×(F)	Automatic (DL1)	129.65	1m above bedrock	-	-
30+330.5	T6	TH	✓	Automatic (DL1)	-	-	16	135/115
30+378.5	Pz03P1A	PZ	✓	Automatic (DL2)	113.12	10m below bedrock	-	-
30+378.5	Pz03P1B	PZ	✓	Automatic (DL2)	118.12	5m below bedrock	-	-
30+378.5	Pz03P1C	PZ	✓	Automatic (DL2)	124.12	1m above bedrock	-	-
30+378.5	Pz03P2A	PZ	✓	Automatic (DL2)	113.1	10m below bedrock	-	-
30+378.5	Pz03P2B	PZ	✓	Automatic (DL2)	118.1	5m below bedrock	-	-
30+378.5	Pz03P2C	PZ	✓	Automatic (DL2)	124.1	1m above bedrock	-	-
30+378.5	Pz03P3A	PZ	✓	Automatic (DL2)	113.58	10m below bedrock	-	-
30+378.5	Pz03P3B	PZ	✓	Automatic (DL2)	118.58	5m below bedrock	-	-
30+386	T7	TH	✓	Automatic (DL2)	-	-	16	135/115
30+417.5	T8	TH	✓	Automatic (DL2)	-	-	16	135/115
30+440	Pz09P2	PZ	✓	Automatic (DL2)	126.73	1m above bedrock	-	-
30+453.5	Pz04P1A	PZ	×(F)	Automatic (DL2)	116.61	10m below bedrock	-	-
30+453.5	Pz04P1B	PZ	×(F)	Automatic (DL2)	118.61	5m below bedrock	-	-
30+453.5	Pz04P1C	PZ	×(F)	Automatic (DL2)	124.61	1m above bedrock	-	-
30+453.5	Pz04P2A	PZ	✓	Automatic (DL2)	115.13	10m below bedrock	-	-
30+453.5	Pz04P2B	PZ	✓	Automatic (DL2)	120.13	5m below bedrock	-	-
30+453.5	Pz04P2C	PZ	✓	Automatic (DL2)	126.13	1m above bedrock	-	-
30+453.5	Pz04P3A	PZ	✓	Automatic (DL2)	115.25	10m below bedrock	-	-
30+453.5	Pz04P3B	PZ	✓	Automatic (DL2)	120.25	5m below bedrock	-	-

Station #	Instrument ID ID	Type PZ/TH	Status Operational (✓)/Not operational (×)/ Frozen (F)	Readings Manual/ Automatic	For PZ		For TH	
					Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
30+489.5	T9	TH	✓	Automatic (DL2)	-	-	16	135/115
30+516.5	Pz010P2	PZ	×(F)	Automatic (DL2)	130.26	1m above bedrock	-	-
30+553.25	T10	TH	✓	Automatic (DL2)	-	-	16	135/115
30+621.5	T11	TH	✓	Automatic (DL3)	-	-	16	135/115
30+645.5	Pz05P1A	PZ	×(F)	Automatic (DL3)	118	10m below bedrock	-	-
30+645.5	Pz05P1B	PZ	×(F)	Automatic (DL3)	123	5m below bedrock	-	-
30+645.5	Pz05P1C	PZ	×(F)	Automatic (DL3)	129	1m above bedrock	-	-
30+645.5	Pz05P2A	PZ	✓	Automatic (DL3)	117.85	10m below bedrock	-	-
30+645.5	Pz05P2B	PZ	✓	Automatic (DL3)	122.85	5m below bedrock	-	-
30+645.5	Pz05P2C	PZ	×(F)	Automatic (DL3)	128.85	1m above bedrock	-	-
30+645.5	Pz05P3A	PZ	✓	Automatic (DL3)	115.15	10m below bedrock	-	-
30+645.5	Pz05P3B	PZ	✓	Automatic (DL3)	122.6	5m below bedrock	-	-
30+650	TH12	TH	✓	Automatic (DL3)	-	-	16	135/115
30+684.5	Pz11P2	PZ	×(F)	Automatic (DL3)	130.65	1m above bedrock	-	-
30+713	TH13	TH	✓	Automatic (DL3)	-	-	16	135/115
30+770	Pz12P2	PZ	×(F)	Automatic (DL3)	132.16	1m above bedrock	-	-
30+804.5	Pz13P2	PZ	×(F)	Automatic (DL3)	132.05	1m above bedrock	-	-
30+827	TH14	TH	✓	Automatic (DL3)	-	-	16	135/115
31+052	Pz14P2	PZ	×(F)	Automatic (DL4)	131.06	1m above bedrock	-	-
31+080	TH15	TH	✓	Automatic (DL4)	-	-	16	135/115
31+134.5	TH16	TH	✓	Automatic (DL4)	-	-	16	135.08/115.08

Station #	Instrument ID ID	Type PZ/TH	Status Operational (✓)/Not operational (×)/ Frozen (F)	Readings Manual/ Automatic	For PZ		For TH	
					Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
31+165	Pz23P1A	PZ	×(F)	Automatic (DL4)	118.49	10m below bedrock	-	-
31+165	Pz23P1B	PZ	×(F)	Automatic (DL4)	123.49	5m below bedrock	-	-
31+165	Pz23P1C	PZ	×(F)	Automatic (DL4)	127.49	1m above bedrock	-	-
31+165	Pz23P2A	PZ	✓	Automatic (DL4)	116.91	10m below bedrock	-	-
31+165	Pz23P2B	PZ	✓	Automatic (DL4)	121.91	5m below bedrock	-	-
31+165	Pz23P2C	PZ	✓	Automatic (DL4)	127.91	1m above bedrock	-	-
31+165	Pz23P3A	PZ	✓	Automatic (DL4)	116.96	10m below bedrock	-	-
31+165	Pz23P3B	PZ	✓	Automatic (DL4)	121.96	5m below bedrock	-	-
31+170	TH17	TH	✓	Automatic (DL4)	-	-	16	135/115
31+220	Pz15P2	PZ	×(F)	Automatic (DL4)	130.73	1m above bedrock	-	-
31+352	TH18	TH	✓	Automatic (DL4)	-	-	16	135/115
31+565	Pz16P2	PZ	×(F)	Automatic (DL5)	131.28	1m above bedrock	-	-
31+595	TH19	TH	✓	Automatic (DL5)	-	-	16	135/108
31+600	Pz24P1A1	PZ	✓	Automatic (DL5)	111.3	11m below bedrock	-	-
31+600	Pz24P1A2	PZ	✓	Automatic (DL5)	116.3	4m below bedrock	-	-
31+600	Pz24P1B1	PZ	✓	Automatic (DL5)	121.8	1m above bedrock	-	-
31+600	Pz24P1B2	PZ	✓	Automatic (DL5)	124.3	4m above bedrock	-	-
31+600	Pz24P2A1	PZ	✓	Automatic (DL5)	110.15	10m below bedrock	-	-
31+600	Pz24P2A2	PZ	✓	Automatic (DL5)	116.15	4m below bedrock	-	-
31+600	Pz24P2B1	PZ	✓	Automatic (DL5)	120.65	10m above bedrock	-	-
31+600	Pz24P2B2	PZ	✓	Automatic (DL5)	123.15	3m above bedrock	-	-

Station #	Instrument ID ID	Type PZ/TH	Status Operational (✓)/Not operational (×)/ Frozen (F)	Readings Manual/ Automatic	For PZ		For TH	
					Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
31+600	Pz24P2C	PZ	✓	Automatic (DL5)	124.65	4m above bedrock	-	-
31+600	Pz24P3A1	PZ	✓	Automatic (DL5)	110.64	10m below bedrock	-	-
31+600	Pz24P3A2	PZ	✓	Automatic (DL5)	115.64	5m below bedrock	-	-
31+600	Pz24P3B1	PZ	✓	Automatic (DL5)	121.16	11m above bedrock	-	-
31+600	Pz24P3B2	PZ	✓	Automatic (DL5)	123.00	13m above bedrock	-	-
31+605	TH20	TH	✓	Automatic (DL5)	-	-	16	135/115
31+615	Pz17P2	PZ	×(F)	Automatic (DL5)	129.4	1m above bedrock	-	-
31+700	Pz18P2	PZ	×(F)	Automatic (DL5)	130.53	1m above bedrock	-	-
31+752.5	TH21	TH	✓	Automatic (DL6)	-	-	16	135/115
31+815	Pz25P1A1	PZ	✓	Automatic (DL6)	117.02	7m below bedrock	-	-
31+815	Pz25P1A2	PZ	✓	Automatic (DL6)	122.02	2m below bedrock	-	-
31+815	Pz25P1B1	PZ	×(F)	Automatic (DL6)	127.52	3m above bedrock	-	-
31+815	Pz25P1B2	PZ	×(F)	Automatic (DL6)	129.52	5m above bedrock	-	-
31+815	Pz25P2A1	PZ	✓	Automatic (DL6)	113.82	11m below bedrock	-	-
31+815	Pz25P2A2	PZ	✓	Automatic (DL6)	118.82	6m below bedrock	-	-
31+815	Pz25P2B1	PZ	✓	Automatic (DL6)	124.32	bedrock	-	-
31+815	Pz25P2B2	PZ	✓	Automatic (DL6)	126.32	2m above bedrock	-	-
31+815	Pz25P2C	PZ	✓	Automatic (DL6)	127.32	3m above bedrock	-	-
31+815	Pz25P3A1	PZ	✓	Automatic (DL6)	115.1	9m below bedrock	-	-
31+815	Pz25P3A2	PZ	✓	Automatic (DL6)	120.1	4m below bedrock	-	-
31+815	Pz25P3B1	PZ	✓	Automatic (DL6)	123.1	12m below bedrock	-	-
31+815	Pz25P3B2	PZ	✓	Automatic (DL6)	125.1	1m above bedrock	-	-

Station #	Instrument ID ID	Type PZ/TH	Status Operational (✓)/Not operational (×)/ Frozen (F)	Readings Manual/ Automatic	For PZ		For TH	
					Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
31+820	TH22	TH	✓	Automatic (DL6)	-	-	16	135/115
31+842	Pz22P2	PZ	✓	Automatic (DL6)	116.8	2m above bedrock	-	-
31+850	TH23	TH	✓	Automatic (DL6)	-	-	16	135/108
31+880	TH24	TH	✓	Automatic (DL6)	-	-	16	135/108
31+885	Pz26P1A1	PZ	✓	Automatic (DL6)	104.44	10m below bedrock	-	-
31+885	Pz26P1A2	PZ	✓	Automatic (DL6)	109.44	5m below bedrock	-	-
31+885	Pz26P1B1	PZ	✓	Automatic (DL6)	114.94	bedrock	-	-
31+885	Pz26P1B2	PZ	✓	Automatic (DL6)	117.94	3m above bedrock	-	-
31+885	Pz26P2A1	PZ	✓	Automatic (DL6)	106.77	8m below bedrock	-	-
31+885	Pz26P2A2	PZ	✓	Automatic (DL6)	111.77	3m below bedrock	-	-
31+885	Pz26P2B1	PZ	✓	Automatic (DL6)	117.27	2m above bedrock	-	-
31+885	Pz26P2B2	PZ	✓	Automatic (DL6)	120.27	5m above bedrock	-	-
31+885	Pz26P2C	PZ	✓	Automatic (DL6)	123.27	8m above bedrock	-	-
31+885	Pz26P3A1	PZ	✓	Automatic (DL6)	104.74	10m below bedrock	-	-
31+885	Pz26P3A2	PZ	✓	Automatic (DL6)	109.69	5m below bedrock	-	-
31+885	Pz26P3B1	PZ	✓	Automatic (DL6)	117.46	2m above bedrock	-	-
31+885	Pz26P3B2	PZ	✓	Automatic (DL6)	120.46	5m above bedrock	-	-
31+928	Pz19P2	PZ	✓	Automatic (DL7)	123.22	1m above bedrock	-	-
31+960	TH25	TH	✓	Automatic (DL7)	-	-	16	135/115
31+990	Pz20P2	PZ	✓	Automatic (DL7)	122.44	1m above bedrock	-	-
31+995	TH26	TH	✓	Automatic (DL7)	-	-	16	135/115

Station	Instrument ID	Type	Status	Readings	For PZ		For TH	
#	ID	PZ/TH	Operational (✓)/Not operational (×)/ Frozen (F)	Manual/ Automatic	Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
32+000	Pz27P1A1	PZ	✓	Automatic (DL7)	113.25	8m below bedrock	-	-
32+000	Pz27P1A2	PZ	✓	Automatic (DL7)	118.25	3m below bedrock	-	-
32+000	Pz27P1B1	PZ	✓	Automatic (DL7)	123.75	2m above bedrock	-	-
32+000	Pz27P1B2	PZ	✓	Automatic (DL7)	125.75	4m above bedrock	-	-
32+000	Pz27P2A1	PZ	✓	Automatic (DL7)	112.61	9m below bedrock	-	-
32+002	Pz27P2A2	PZ	✓	Automatic (DL7)	117.61	4m below bedrock	-	-
32+000	Pz27P2B1	PZ	✓	Automatic (DL7)	123.11	2m above bedrock	-	-
32+000	Pz27P2B2	PZ	✓	Automatic (DL7)	125.11	4m above bedrock	-	-
32+000	Pz27P2C	PZ	✓	Automatic (DL7)	126.61	5m above bedrock	-	-
32+000	Pz27P3A1	PZ	✓	Automatic (DL7)	111.72	10m below bedrock	-	-
32+000	Pz27P3A2	PZ	✓	Automatic (DL7)	116.72	5m below bedrock	-	-
32+000	Pz27P3B1	PZ	✓	Automatic (DL7)	122.22	1m above bedrock	-	-
32+000	Pz27P3B2	PZ	×(F)	Automatic (DL7)	123.22	2m above bedrock	-	-
32+020	Pz21P2	PZ	✓	Automatic (DL7)	121.13	1m above bedrock	-	-
32+030	TH27	TH	✓	Automatic (DL7)	-	-	16	135/108
32+060	TH28	TH	✓	Automatic (DL7)	-	-	16	135/108
32+065	Pz28P1A1	PZ	✓	Automatic (DL7)	102.99	12m below bedrock	-	-
32+065	Pz28P1B1	PZ	✓	Automatic (DL7)	107.99	7m below bedrock	-	-
32+065	Pz28P1B2	PZ	✓	Automatic (DL7)	112.99	2m below bedrock	-	-
32+065	Pz28P1B3	PZ	✓	Automatic (DL7)	115.99	1m above bedrock	-	-
32+065	Pz28P2A1	PZ	✓	Automatic (DL7)	105.02	10m below bedrock	-	-

Station	Instrument ID	Type	Status	Readings	For PZ		For TH	
#	ID	PZ/TH	Operational (✓)/Not operational (×)/ Frozen (F)	Manual/ Automatic	Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
32+065	Pz28P2B1	PZ	✓	Automatic (DL7)	110.02	5m below bedrock	-	-
32+065	Pz28P2B2	PZ	✓	Automatic (DL7)	115.02	bedrock	-	-
32+065	Pz28P2B3	PZ	✓	Automatic (DL7)	118.02	3m above bedrock	-	-
32+065	Pz28P2C	PZ	✓	Automatic (DL7)	124.02	9m above bedrock	-	-
32+065	Pz28P3A1	PZ	✓	Automatic (DL7)	105.91	10m below bedrock	-	-
32+065	Pz28P3B1	PZ	✓	Automatic (DL7)	110.91	5m below bedrock	-	-
32+065	Pz28P3B2	PZ	✓	Automatic (DL7)	115.91	1m above bedrock	-	-
32+065	Pz28P3B3	PZ	✓	Automatic (DL7)	118.91	4m above bedrock	-	-
32+100	TH29	TH	✓	Automatic (DL7)	-	-	16	135/115
32+105	Pz29P1A1	PZ	✓	Automatic (DL7)	115.32	10m below bedrock	-	-
32+105	Pz29P1B1	PZ	✓	Automatic (DL7)	120.32	5m below bedrock	-	-
32+105	Pz29P1B2	PZ	×(F)	Automatic (DL7)	125.32	bedrock	-	-
32+105	Pz29P1B3	PZ	×(F)	Automatic (DL7)	127.32	2m above bedrock	-	-
32+105	Pz29P2A1	PZ	✓	Automatic (DL7)	114.99	10m below bedrock	-	-
32+105	Pz29P2B1	PZ	✓	Automatic (DL7)	119.99	5m below bedrock	-	-
32+105	Pz29P2B2	PZ	✓	Automatic (DL7)	124.99	bedrock	-	-
32+105	Pz29P2B3	PZ	×(F)	Automatic (DL7)	126.99	2m above bedrock	-	-
32+105	Pz29P2C	PZ	×(F)	Automatic (DL7)	129.99	5m above bedrock	-	-
32+105	Pz29P3A1	PZ	✓	Automatic (DL7)	115.91	9m below bedrock	-	-
32+105	Pz29P3B1	PZ	✓	Automatic (DL7)	120.91	4m below bedrock	-	-
32+105	Pz29P3B2	PZ	✓	Automatic (DL7)	125.91	1m above bedrock	-	-
32+105	Pz29P3B3	PZ	×(F)	Automatic (DL7)	127.91	3m above bedrock	-	-
32+140	TH30	TH	✓	Automatic (DL7)	-	-	16	135/115

Table 5: List of Inclinometers on Bay-Goose Dike (source: AEM)

Location	Instrument ID	Operational (✓)/Not operational (×)	Manual/Automatic	Elevation interval in meters (top/bottom)
30+282	BG-IN-30+282	✓	Manual	139.3/124.8
30+390	BG-IN-30+390	✓	Manual	140.0/119.0
30+640	BG-IN-30+640	✓	Manual	138.8/124.3
31+180	BG-IN-31+180	✓	Manual	139.0/124.5
31+590	BG-IN-31+590	✓	Manual	139.5/115.0
31+815	BG-IN-31+815	✓	Manual	139.2/119.7
31+885	BG-IN-31+885	✓	Manual	138.8/113.3
32+065	BG-IN-32+065	✓	Manual	139.1/116.6

Table 6: List of TDR Reflectometers on Goose Pit wall (source: AEM)

Location of hole	DL #	Instrument ID	Inclination (°)	Length (m)	Casing elevation (m)	Crimps
31+255	9	TDR-11	60	70	134.4	Every 25 m
31+153	9	TDR-12	60	180	133.5	Every 25 m
31+058	9	TDR-15	60	180	134.3	Every 25 m
31+035	9	TDR-17	60	206.35	134.9	Every 25 m
30+937	9	TDR-18	60	180	135.6	Every 25 m
30+960	9	TDR-20	60	200	136.5	Every 25 m

1.4 Vault Dike

The construction of Vault Dike was done in the winter of 2013 to keep its foundation frozen.

Five thermistor strings were originally installed on Vault Dike following its construction in the winter of 2013 and four are still operational. TH3 is installed in the deepest channel downstream, TH5 is installed under the liner, TH6 is installed upstream of the liner, TH7 is installed east of the deepest channel, and TH8 is installed upstream in the deepest channel outside of the key trench. One thermistor (TH-3, on the side of Vault Lake) had been damaged by sloughing in previous year and stopped working in October 2015.

Table 7 below details instrumentation on Vault Dike.

Table 7: List of Thermistors on Vault Dike (source: AEM)

Hole	ID	Type	Status	Readings	For PZ		For TH	
#	ID	PZ/TH	Operational (✓)/Not operational (×)	Manual/ Automatic	Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
71-2	VD-TH5	TH	✓	Manual	-	-	16	142.50/136.10
94-2	VD-TH6	TH	✓	Manual	-	-	16	140.50/121.50
96-1	VD-TH8	TH	✓	Manual	-	-	16	140.50/119.50
96-2	VD-TH7	TH	✓	Manual	-	-	16	140.50/119.50

2.0 TAILINGS STORAGE FACILITY

The TSF was commissioned in conjunction with the mill start-up in February 2010, with tailings being deposited within the North Cell of the facility. The North Cell and structures Saddle Dam 1, Saddle Dam 2 and Stormwater Dike were constructed to El. 150 m in two stages from 2009 to 2011.

The construction of the South Cell started in 2012 with Central Dike, thereby closing the eastern portion of the South Cell. The beginning of the tailings deposition in the South Cell started at the end of 2014. From 2012 to 2018, Central Dike was raised to El. 145 m in six stages. To increase the capacity of the South Cell, additional peripheral structures (Saddle Dam 3, Saddle Dam 4 and Saddle Dam 5) were constructed to El. 145 m in three stages from 2015 to 2018. The South Cell is designed to be able to be raised to El. 150 m. The construction of subsequent portions of the South Cell could occur in the future in the unlikely case of additional capacity being required.

2.1 North Cell Internal Structure – North Cell

The North Cell Internal Structure was built in 2018 to El. 152 m from Sta. 1+100 m to 1+660 m and from 2+750 m to 3+200 m, and to El. 154 m from Sta. 1+660 m to 2+750. This stage is an intermediate phase and the structure could be raised and lengthened to provide additional capacity if required. The tailings deposition from the North Cell Internal Structure started in August 2018.

Tailings deposition was transferred from the North Cell to the South Cell at the end of 2014. Tailings deposition occurred during the summer of 2015 within the North Cell and resumed in the South Cell in October 2015. Progressive closure of the North Cell started in the winter of 2015 with the construction of a non-acid generating rockfill capping over the tailings and continued in the winter of 2016.

A rockfill berm was constructed in 2016 at the toe of Stormwater Dike in the South Cell (from Sta. 10+300 to Sta. 10+750) to mitigate the crest and downstream slope movement observed in this sector at the end of August 2016. Following an investigation and instrumentation program, the movements observed are inferred to be caused by the soft sediment foundation thawing and settling due to the South Cell water pond reaching the dike foundation during the summer. Water ponding against Stormwater Dike is part of the tailings deposition plan and is acceptable, as Stormwater Dike is not a peripheral structure. Having direct ponding water within Stormwater Dike foundation is geotechnically acceptable. For South Cell closure and environmental aspects, given that it is inferred that the Stormwater Dike foundation presents some open windows of exposed fractured bedrock that may contribute to feeding the seepage at Central Dike, it is recommended that a beach be put in place along Stormwater Dike downstream slope to seal the foundation before the end of the deposition activities.

Four vertical thermistor strings were installed on the crest of the North Cell Internal Structure in August 2018 (NCIS-01, NCIS-02, NCIS-03 and NCIS-04). NCIS-01, NCIS-02 and NCIS-04 are installed on the upstream side of the dike whereas NCIS-02 is installed on the downstream side.

Table 8 below details instrumentation on the North Cell Internal Structure.

Table 8: List of Instruments on the North Cell Internal Structure (source: AEM)

Hole	Instrument ID	Type	Status	Readings	For PZ		For TH	
#	ID	PZ/TH	Operational (✓)/Not operational (×)	Manual/ Automatic	Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
NCIS-T1	NCIS-18-01	Thermistor	✓	Automatic (DL55)	-	-	16	140/110
NCIS-T2	NCIS-18-02	Thermistor	No data X	Automatic (DL55)	-	-	16	134/119
NCIS-T3	NCIS-18-03	Thermistor	✓	Automatic (DL56)	-	-	16	149/132.84
NCIS-T4	NCIS-18-04	Thermistor	✓	Automatic (DL57)	-	-	16	148/118
PSM	NCIS1 TO NCIS16	Prism	✓	Manual	-	-	-	-

2.2 Saddle Dam 1 – North Cell

Stage 1 of Saddle Dam 1 was constructed in the fall of 2009 to a height of 10 m (crest elevation of 141 m) and a length of 250 m. Stage 2 was constructed in 2010 to an overall height of 20 m (final crest elevation of 150 m) and length of about 400 m.

Three thermistors (T1, T2, T3) are installed to monitor the thermal condition within the structure and its foundation; they were installed in 2009 and early 2010 as part of Stage 1. The fourth thermistor string (T4) was installed in 2009 and extended in 2010 along the upstream face of the dam to monitor the thermal condition of the tailings. The SD1-T1 thermistor string is installed in the centre of the upstream face of the dike immediately beneath the geomembrane liner to monitor temperatures within the deposited tailings. A thin layer of protective granular material exists above the geomembrane liner at this location. The SD1-T2 thermistor string is installed vertically through the upstream Stage 1 crest in the centre of the dike at El. 140 m. The SD1-T3 thermistor string is installed vertically through the upstream Stage 2 crest in the centre of the dike at El. 150 m. The SD1-T4 thermistor string is installed vertically through the upstream toe of the dike near the centre of the dike.

Table 9 below details instrumentation on Saddle Dam 1.

Table 9: List of Thermistors on Saddle Dam 1 (source: AEM)

Hole	Instrument ID	Type	Status	Readings	For PZ		For TH	
#	ID	PZ/TH	Operational (✓)/Not operational (×)	Manual/ Automatic	Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
SD1-T2	SD1-02	Thermistor	✓	Automatic (DL14)	-	-	16	140/110
SD1-T4	SD1-04	Thermistor	✓	Automatic (DL14)	-	-	16	134/119
SD1-T1	SD1-01	Thermistor	✓	Automatic (DL14)	-	-	16	149/132.84
SD1-T3	SD1-03	Thermistor	✓	Automatic (DL14)	-	-	15/16	148/118

2.3 Saddle Dam 2 – North Cell

Saddle Dam 2 was constructed in one stage in 2011 to a crest elevation of 150 m. Saddle Dam 2 has a maximum height of about 10 m and a crest length of 460 m.

Table 10 below details instrumentation on Saddle Dam 2.

Table 10: List of Thermistors on Saddle Dam 2 (source: AEM)

Hole	Instrument ID	Type	Status	Readings	For PZ		For TH	
#	ID	PZ/TH	Operational (✓)/Not operational (×)	Manual/ Automatic	Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
SD2-T1	SD2-01	Thermistor	✓	Automatic (DL15)	-	-	16	148.05/145.31
SD2-T2	SD2-02	Thermistor	✓	Automatic (DL15)	-	-	16	148/118

SD2-T3	SD2-03	Thermistor	✓	Automatic (DL15)	-	-	16	144/129
SD2-T4	SD2-04	Thermistor	✓	Automatic (DL15)	-	-	16	148/123

2.4 RF1/RF2 – North Cell

Four thermistors were installed in 2012 to monitor the temperature of RF1 and RF2 (which delineates the northeastern side of the TSF North Cell).

Table 11 below details instrumentation on RF1 and RF2.

Table 11: List of Thermistors on RF1 and RF2 (source: AEM)

Hole	Instrument ID	Type	Status	Readings	For PZ		For TH	
#	ID	PZ/TH	Operational (✓)/Not operational (×)	Manual/ Automatic	Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
121-1	121-RF1-1	Thermistor	✓	Manual	-	-	16/16	136/90
73-6	73-6-RF1-2	Thermistor	✓	Manual	-	-	14/16	149.5/133
RF1-3	RF1-3	Thermistor	✓	Manual	-	-	11/11	148/144
122-1	122-1RF2	Thermistor	✓	Manual	-	-	14/16	137/90

2.5 North Cell Tailings

Five thermistors are installed in the tailings of the North Cell of the TSF (SWD-1, SD2-1, 90-1, NC-TH-1 and NC-TH-2). These thermistors were installed from 2012 to 2016. Thermistor 90-1 was installed in 2012 in the tailings of the North Cell near Saddle Dam 1. Thermistor NC-T1 and NC-T2 were installed in April 2016 in the tailings of the North Cell in the location of the former reclaim pond. Nine additional thermistors were installed in February 2017 in the tailings of the North Cell (SWD-01, NC17-01, NC-17-02, NC-17-03, NC-17-04, NC-17-05, NC-17-06, NC-17-07, NC-17-08).

Table 12 below details instrumentation in the North Cell tailings.

Table 12: List of Thermistors in the North Cell tailings (source: AEM)

Hole	Instrument ID	Type	Status	Readings	For PZ		For TH	
#	ID	PZ/TH	Operational (✓)/Not operational (×)	Manual/ Automatic	Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
NC-T1	NC-T1	Thermistor	✓	Manual	-	-	16	146.6/86.6
NC-17-01	NC-17-01	Thermistor	✓	Automatic (DL20)	-	-	16	148/112
NC-17-02	NC-17-02	Thermistor	✓	Automatic (DL21)	-	-	16	147.6/102
NC-17-03	NC-17-03	Thermistor	✓	Automatic (DL22)	-	-	13/16	147.6/102.6
NC-17-04	NC-17-04	Thermistor	✓	Automatic (DL23)	-	-	16	148.5/122
NC-17-05	NC-17-05	Thermistor	✓	Automatic (DL24)	-	-	16	146.6/112.6
NC-17-06	NC-17-06	Thermistor	✓	Automatic (DL25)	-	-	16	148/112
NC-17-07	NC-17-07	Thermistor	✓	Automatic (DL26)	-	-	16	148/112
NC-17-08	NC-17-08	Thermistor	✓	Automatic (DL27)	-	-	15/16	146/99

2.6 Stormwater Dike – Divider Dike

Stormwater Dike was progressively constructed. Stage 1 was constructed in 2009 to a height of 10 m (crest elevation of 140 m) and a length of 860 m. Stage 2 was primarily constructed in 2010 to an overall height of 18 m (crest elevation of 148 m) and length of about 1,060 m. A horizontal bench is present along the upstream face of

the structure due to the connection of the 2009 and 2010 portions of the structure. The junction between the bituminous liner of Stormwater Dike and the LLDPE liner of Saddle Dam 2 was completed in 2011. The crest of Stormwater Dike was raised to 150 m in 2013.

The majority of the dike is seated on dense till from the former lakebed within the talik while the abutments are generally founded on bedrock. The foundation preparation of Stage 2 was completed in winter conditions. It was generally done above water except in an area where water ponding was present (between Sta.10+500 and 10+750 approximately). This pond was located where the topography suggests that the soft lakebed sediment thickness may be greater than at other locations along the dike. Due to the presence of water, the ice crust was cracked with the excavator and only minimal foundation preparation was possible. As a result, most of the lakebed sediment probably remained in place in this area.

A single deep thermistor (T147-1) and a piezometer string (VWP 13265) were installed at the downstream toe of Stormwater Dike (within the South Cell). These instruments were broken in September 2016 during the construction of the buttress at the toe of Stormwater Dike within the South Cell. Three new thermistors (TH-SWD-01, TH-SWD-02, TH-SWD-03) and piezometers (PZ-SWD-02-A, PZ-SWD-03-A, PZ-SWD-03-B) were installed since then. SWD-01 is installed on the upstream side of Stormwater Dike within the North Cell tailings. SWD-02 is installed on the downstream side of Stormwater Dike (approx. Sta. 10+650 m) within the stabilization buttress. SWD-03 is installed on the downstream side of Stormwater Dike (approx. Sta. 10+690 m) within the stabilization buttress.

PZ-SWD-02-A and TH-SWD-02 are now broken, while the other piezometers are frozen but still transmit data.

In 25 August 2016 two wireline extensometers, four crack monitoring stations and three prisms were installed on the crest of Stormwater Dike in the area showing movements (between Sta. 10+500 and 10+750 approximately). Following the MDRB recommendations, AEM installed additional instruments in 2017 to monitor the response of Stormwater Dike during tailings deposition in the South Cell. In 2018, an additional prism and 3 crackmeters were added, leading to a total of 3 piezometers, 3 thermistors, 4 extensometers, 3 crackmeters and 20 prisms installed on Stormwater Dike.

Table 13 below details instrumentation on Stormwater Dike.

Table 13: List of Instruments on Stormwater Dike (source: AEM)

Hole	Instrument ID	Type	Status	Readings	For PZ		For TH	
#	ID	PZ/TH	Operational (✓)/Not operational (×)	Manual/ Automatic	Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
SWD-01	SWD-01	Thermistor	✓	Automatic (DL19)			16	148/118
SWD-02	PZ-SWD-02-A	Piezo	×	Automatic (DL19)	62	Bedrock		
	TH-SWD-02	Thermistor	✓	Automatic (DL19)			6	127/117
SWD-03	PZ-SWD-03A	Piezo	Frozen	Automatic (DL19)	110	Bedrock		
	PZ-SWD-03B	Piezo	Frozen	Automatic (DL19)	122			
	TH-SWD-03	Thermistor	✓	Automatic (DL19)			14	125/111
CRK	#1	Crakcmeter	×	Automatic				
	#2	Crackmeter	✓	Automatic				
	#3	Crackmeter	✓	Automatic				
	#4	Crackmeter	✓	Automatic				
EXT	#2	Extensometer	Removed	Manual				
	#3	Extensometer	✓	Manual				
	#4	Extensometer	Removed	Manual				
	#5	Extensometer	Removed	Manual				
	#6	Extensometer	✓	Manual				
PSM	SWD1-16	Prisms	✓	Manual				

2.7 Saddle Dam 3, Saddle Dam 4 and Saddle Dam 5 – South Cell

Stage 1 of Saddle Dam 3 and 4 was constructed in 2015. Stage 1 of Saddle Dam 5 was constructed in 2016. During Stage 1, Saddle Dam 3 and 4 were constructed to El. 140 m and Saddle Dam 5 to El. 137 m. Stage 2 of Saddle Dam 3, 4 and 5 was constructed to El. 143 m in 2016. Stage 3 of Saddle Dam 4 and 5 was constructed to El. 145 m in 2017. Stage 3 of Saddle Dam 3 was constructed partially to El. 145 m in 2017, with the installation the geomembrane and the construction of the liner erosion protection cover completed in 2018. These structures are designed to be able to be raised to El. 150 m and the final crest elevation of these structures is subject to review by AEM. At the end of Stage 3, the decision was made by AEM to close the abutments of these structures, as no further raise was planned at the moment. If these structures are to be raised higher, it will be necessary to re-open the abutments. The completed crest length is approximately 245 m for Saddle Dam 3, 365 m for Saddle Dam 4, and 255 m for Saddle Dam 5.

Five thermistors are installed at Saddle Dam 3. Three of these thermistors are located along the axis of the faulted zone that was encountered during the construction of Saddle Dam 3 (around Sta. 20+650). Along this axis, two thermistors are installed on the crest (SD3-T3 around the centerline and SD3-T2 on the upstream edge), and the other (SD3-T4) is installed on the upstream toe liner tie-in. Another thermistor is installed at Sta. 20+720 within the upstream toe liner tie-in (SD3-T5). One thermistor (SD3-T6) was installed in 2018 on the crest towards the junction with Saddle Dam 2.

Table 14 below details instrumentation on Saddle Dam 3.

Table 14: List of Thermistors on Saddle Dam 3 (source: AEM)

Hole	Instrument ID	Type	Status	Readings	For PZ		For TH	
#	ID	PZ/TH	Operational (✓)/Not operational (×)	Manual/ Automatic	Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
SD3-T2	SD3-02	Thermistor	✓	Automatic (DL16)	-	-	16	139.1/123.1
SD3-T3	SD3-03	Thermistor	✓	Automatic (DL16)	-	-	15	138.6/121.6
SD3-T4	SD3-04	Thermistor	× (since June 2019)	Automatic (DL16)	-	-	0/15	137.3/122.3
SD3-T5	SD3-05	Thermistor	× (since Dec 2019)	Automatic (DL16)	-	-	16	138.4/122.4
SD3-T6	SD3-06	Thermistor	✓	Automatic (DL16)	-	-	16	143.9/113.9

Four thermistors are installed at Saddle Dam 4 near Sta. 40+300. One thermistor (SD4-T2) is installed on the upstream edge crest while another (SD4-T4) is installed in the upstream toe line tie-in, and another one (SD4-T1) is in the centre of the upstream face of the dike immediately on top of the geomembrane liner to monitor the thermal regime of the tailings in contact with the structure. One thermistor (SD4-T3) was installed on the middle of the crest in January 2018.

Table 15 below details instrumentation on Saddle Dam 4.

Table 15: List of Thermistors on Saddle Dam 4 (source: AEM)

Hole	Instrument ID	Type	Status	Readings	For PZ		For TH	
#	ID	PZ/TH	Operational (✓)/Not operational (×)	Manual/ Automatic	Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
SD4-T2	SD4-02	Thermistor	✓	Automatic (DL17)	-	-	16	139/129
SD3-T3	SD3-03	Thermistor	✓	Automatic (DL17)	-	-	16	144/129
SD4-T4	SD4-04	Thermistor	✓	Automatic (DL17)	-	-	5/14	137.3/127.8
SD4-T1	SD4-01	Thermistor	× (since August 2018)	Automatic (DL17)	-	-	16	143.4/139.6

Three thermistors were installed at Saddle Dam 5 in 2018 near Sta. 40+680. One thermistor (SD5-T2) is installed on the downstream edge crest, one (SD5-T4) around the middle of the crest, and another (SD5-T3) is installed in the toe liner tie-in.

Table 16 below details instrumentation on Saddle Dam 5.

Table 16: List of Thermistors on Saddle Dam 5 (source: AEM)

Hole	Instrument ID	Type	Status	Readings	For PZ		For TH	
#	ID	PZ/TH	Operational (✓)/Not operational (×)	Manual/ Automatic	Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in meters (top/bottom)
SD5-02	SD4-02	Thermistor	✓	Automatic (DL58)	-	-	16(cap)	144/129
SD5-03	SD3-03	Thermistor	✓	Automatic (DL58)	-	-	16	141/126
SD5-04	SD4-04	Thermistor	✓	Automatic (DL58)	-	-	16(cap)	144/129

2.8 Central Dike – South Cell

Construction of Central Dike started in 2012 (stage 1) at the El. 110 m with a key trench located underneath the centreline. In 2013 (Stage 2), the footprint of Central Dike was widened for a crest elevation of 150 m, the structure was raised to El. 115 m and the key trench was relocated at the upstream toe. In 2014 (Stage 3), the key trench was relocated at the upstream toe and constructed to El. 132 m. Central Dike was raised to El. 137 in 2015 (Stage 4), to El. 143 m in 2016 (Stage 5), and to El. 145 m in two steps in 2017 and 2018 (Stage 6). Central

Dike is designed to be able to be raised to El. 150 m and the final crest elevation is subject to review by AEM. The completed crest length is approximately 900 m at El. 145 m.

Desktop studies were undertaken by Golder in 2015 to estimate the seepage flows and pore water pressures, verify the dike stability, and attempt to predict the eventual flow volume that would report to the downstream toe for higher pond elevation. The seepage pathway used in the Golder 2015 model was through a layer of fine material in the till layer of the foundation as it was deemed the most critical scenario for the structure stability. The main recommendation from this desktop study was to maintain beaches adjacent to Central Dike and to maintain a 'back pressure' on the downstream side of Central Dike in order to reduce the hydraulic gradient by holding the downstream pond at El. 115 m. Willowstick was also hired to carry out electromagnetic surveys to detect seepage paths. The geophysical campaign led to additional recommendations and identified possible seepage path locations. Following the geophysical campaign, an investigation was conducted by SNC-Lavalin (SNC) and AEM in December 2015 at station CD-595, and between CD-810 and CD-850. Highly altered and fractured bedrock was encountered, and high hydraulic conductivity was measured from Packer testing. Instrumentation of the four boreholes with piezometers and thermistors was done at the same time. A study has been completed in 2017 by Golder to update the seepage modelling with a seepage flow through the bedrock, and allowed for updating of the Emergency Preparedness Plan as well as the Operation, Maintenance, and Surveillance Manual. The summer 2017 investigation and instrumentation campaign shows that the seepage pathway was most probably mainly controlled by the bedrock.

Instruments were installed on Central Dike to monitor the dike's performance during its construction, operation, and closure. Nine boreholes were drilled on three rows corresponding to the central key trench (545-P1, 580-P1, 650-P1 and 750-P1), the final downstream toe (545-P2 and 650-P2) and the Portage Pit limit (465-P3, 650-P3, 875-P3 and WR-P3). Four additional boreholes were drilled and instrumented in 2016 during the seepage field investigation in the key trench alignment (595-P1, 810-P1, 825-P1 and 850-P1). Two thermistor strings were also installed on the upstream face to monitor the temperature within the tailings of the South Cell.

Seven additional boreholes were drilled and instrumented in 2017 (700-P1, 745-P3, 800-P2, 800-P3, 875-P2, 975-P3 and 1050-P3).

In October 2020, four additional boreholes were drilled and instrumented to replace broken instruments (545-P1R, 595-P1R, 650-P1R, 815-P1R). These instruments have not yet been added to the Table 17 below that details instrumentation on Central Dike.

Table 17: List of Piezometers and Thermistors on Central Dike (source: AEM)

Hole #	Instrument ID ID	Type PZ/TH	Status Operational (✓)/Not operational (×)	Readings Manual/ Automatic	For PZ Elevation (m)	For PZ Stratigraphic unit	For TH Number of operational beads	For TH Elevation interval in meters (top/bottom)
465-P3	465-P3-A	Piezo	Frozen	Automatic	65	Bedrock	-	-
	465-P3-B	Piezo	Frozen	Automatic	85	Bedrock	-	-
	465-TH-P3	Thermistor	✓	Automatic	-	-	10/13	105/69
545-P1	545-P1-A	Piezo	× (since July 11, 2019)	Automatic	65	Bedrock	-	-
	545-P1-B	Piezo	× (since Nov. 2018)	Automatic	76	Bedrock	-	-
	545-P1-C	Piezo	× (since Sept 2018)	Automatic	80	Dense Till	-	-
	545-P1-D	Piezo	× (since Dec. 2018)	Automatic	88	Dense Till	-	-
	545-TH-P1	Thermistor	× (since Nov. 2019)	Automatic	-	-	5/13	111/63
545-P2	545-P2-A	Piezo	× (since Jan 2, 2019)	Automatic	65	Bedrock	-	-
	545-P2-B	Piezo	× (since Jan 2, 2019)	Automatic	85	Bedrock	-	-
	545-P2-C	Piezo	× (since Jan 21, 2019)	Automatic	100	Bedrock	-	-
	545-P2-D	Piezo	× (since Mar 28, 2019)	Automatic	104	Rock fill/Till	-	-
	545-TH-P2	Thermistor	✓	Automatic	-	-	13	105/51
580-P1	580-P1-A	Piezo	× (since July 2016)	Automatic				
	580-P1-B	Piezo	× (since July 2016)	Automatic				
	580-P1-C	Piezo	× (since July 2016)	Automatic				
	580-P1-D	Piezo	× (since July 2016)	Automatic				
	580-P1-E	Piezo	× (since July 2016)	Automatic				
	580-TH-P1	Thermistor	× (since July 2016)	Automatic				
580-P1R	580-P1-A	Piezo	✓	Automatic				
	580-P1-B	Piezo	✓	Automatic				
	580-P1-C	Piezo	✓	Automatic	-	-	-	-
	580-TH-P1R	Thermistor	✓	Automatic	-	-	-	-
595-P1	595-P1-A	Piezo	✓	Automatic	69.25	Bedrock	-	
	595-P1-B	Piezo	✓	Automatic	85.2	Bedrock (Casing)	-	
	595-P1-C	Piezo	✓	Automatic	92.2	Bedrock (Casing)	-	-
	595-P1-D	Piezo	× (June 2017)	Automatic	96.2	Dense Till (Casing)	-	-
	595-P1-E	Piezo	× (June 2017)	Automatic	105.2	Rock fill (Casing)	-	-
	595-TH	Thermistor	✓	Automatic	-	-	16	114.60/69.60

650-P1	650-P1-A	Piezo	× (since February 2016)	-	-	-	-	-
	650-P1-B	Piezo	× (since September 2016)	-	-	-	-	-
	650-P1-C	Piezo	× (since September 2016)	-	-	-	-	-
	650-P1-D	Piezo	× (since September 2016)	-	-	-	-	-
	650-TH-P1	Thermistor	× (since August 2016)	-	-	-	-	-

650-P2	650-P2-A	Piezo	✓	Automatic	65	Bedrock	-	-
	650-P2-B	Piezo	✓	Automatic	85	Bedrock	-	-
	650-P2-C	Piezo	✓	Automatic	99.5	Bedrock	-	-
	650-P2-D	Piezo	✓	Automatic	103.5	Rock fill/Till	-	-
	650-TH-P2	Thermistor	× (since June 28, 2019))	Automatic	-	-	13	105/51
650-P3	650-P3-A	Piezo	Frozen	Automatic	65	Bedrock	-	-
	650-P3-B	Piezo	Frozen	Automatic	85	Bedrock	-	-
	650-TH-P3	Thermistor	✓	Automatic	-	-	13	105/51
700-P1	700-P1-a	Piezo	✓					
	700-P1-B	Piezo	✓					
	700-P1-C	Piezo	✓					
	700-P1-D	Piezo	✓					
	700-TH-P1	Thermistor	✓					
750-P1	750-P1-A	Piezo	✓	Automatic	65	Bedrock	-	-
	750-P1-B	Piezo	✓	Automatic	76	Bedrock	-	-
	750-P1-C	Piezo	✓	Automatic	80	Dense Till	-	-
	750-P1-D	Piezo	✓	Automatic	88	Dense Till	-	-
	750-P1-E	Piezo	✓	Automatic	100	Rock fill	-	-
	750-TH-P1	Thermistor	✓	Automatic	-	-	13	111/63
810-P1	810-P1-A	Piezo	× (since Dec. 2017)	Automatic	67.7	Bedrock	-	-
	810-P1-B	Piezo	× (since January 2017)	-	-	-	-	-
	810-P1-C	Piezo	× (since Sept 2018)	Automatic	86.9	Dense Till	-	-
	810-P1-D	Piezo	× Elev. Working only	Automatic	93.9	Dense Till	-	-
	810-TH	Thermistor	× (since February 2018)	Automatic	-	-	0/16	134.84/114.84
825-P1	825-P1-A	Piezo	✓	Automatic	74.15	Bedrock	-	-
	825-P1-B	Piezo	✓	Automatic	93.5	Bedrock	-	-
	825-P1-E	Piezo	✓	Automatic	101	Till (Casing)	-	-
	825-TH	Thermistor	✓	Automatic	-	-	14/16	131.25/71.25
850-P1	850-P1-A	Piezo	✓	Automatic	72	Bedrock	-	-
	850-P1-B	Piezo	✓	Automatic	93.7	Bedrock	-	-
	850-P1-E	Piezo	✓	Automatic	106	Rock fill	-	-
	850-TH	Thermistor	✓	Automatic	-	-	13/16	133.02/73.02
875-P3	875-P3-A	Piezo	✓	Automatic	65	Bedrock	-	-

	875-P3-B	Piezo	✓	Automatic	85	Bedrock	-	-
	875-TH-P3	Thermistor	✓	Automatic	-	-	11/13	105/51
875-P2	875-P2-A	Piezo	✓	Automatic	65.08	Bedrock	-	-
	875-P2-B	Piezo	✓	Automatic	85.08	Bedrock	-	-
	875-P2-C	Piezo	Frozen	Automatic	105.38	Bedrock	-	-
	875-P2-D	Piezo	Frozen	Automatic	107.58	Till	-	-
	TH-875-P2	Thermistor	✓	Automatic	-	-	15/16	120.08/63.08
800-P2	800-P2-A	Piezo	✓	Automatic	70.07	Bedrock	-	-
	800-P2-B	Piezo	✓	Automatic	85.07	Bedrock	-	-
	800-P2-C	Piezo	✓	Automatic	95.07	Bedrock	-	-
	800-P2-D	Piezo	✓	Automatic	105.07	Rock fill/Till	-	-
	TH-800-P2	Thermistor	✓	Automatic	-	-	16	120.07/70.07

700-P1	700-P1-A	Piezo	✓	Automatic	63.43	Bedrock	-	-
	700-P1-B	Piezo	✓	Automatic	86.93	Bedrock	-	-
	700-P1-C	Piezo	✓	Automatic	97.43	Bedrock	-	-
	700-P1-D	Piezo	✓	Automatic	101.43	Void before bedrock	-	-
	TH-700-P1	Thermistor	✓	Automatic	-	-	16	118.43/63.43
580-P1 (R)	580-P1-R-A (R)	Piezo	✓	Automatic	69.55	Sand	-	-
	580-P1-R-B (R)	Piezo	✓	Automatic	75.55	Bedrock	-	-
	580-P1-R-C (R)	Piezo	✓	Automatic	79.05	Bedrock	-	-
	TH-580-P1 (R)	Thermistor	✓	Automatic	-	-	16	120.55/65.55
1050-P3	1050-P3-A	Piezo	Frozen	Automatic	66.37	Bedrock	-	-
	1050-P3-B	Piezo	Frozen	Automatic	86.37	Bedrock	-	-
	TH-1050-P3	Thermistor	✓	Automatic	-	-	16	134.77/65.77
975-P3	975-P3-A	Piezo	✓	Automatic	64.53	Bedrock	-	-
	975-P3-B	Piezo	✓	Automatic	84.53	Bedrock	-	-
	TH-975-P3	Thermistor	✓	Automatic	-	-	16	131.12/64.12
800-P3	800-P3-A	Piezo	✓	Automatic	62.95	Bedrock	-	-
	800-P3-B	Piezo	✓	Automatic	82.95	Bedrock	-	-
	800-P3-C	Piezo	✓	Automatic	96.45	Till	-	-
	TH-800-P3	Thermistor	✓	Automatic	-	-	16	118.95/62.95
745-P3 (WR-P3)	TH-745-P3	Thermistor	✓	Automatic	-	-	8/16	125.08/102.08
CD_US-0+650	CD-US-1	Thermistor	✓	Automatic	-	-	16	126.40/111.056
	CD-US-2	Thermistor	✓	Automatic	-	-	16	143/127
SD5	TH-02	Thermistor	✓	Automatic	-	-	12/16	144/129
	TH-03	Thermistor	✓	Automatic	-	-	16	141/126
	TH-04	Thermistor	✓	Automatic	-	-	9/16	144/129

Table 18: List of Piezometers Recording Suction on Central Dike

Name of Piezometer	Installation Unit	Observation
545-P1-A	Bedrock	Suction.
580-P1R-B	Bedrock	Suction.
750-P1-(A,B,C)	Bedrock, till	Suction.
545-P2 B	Bedrock	Suction.
545-P2-C	Bedrock	Suction.
545-P2-D	Till	Suction.
650-P2-D	Till	Suction. Frozen.
650-P3-B	Bedrock	Suction. Frozen.

3.0 WHALE TAIL PROJECT DEWATERING DIKES

3.0 Whale Tail Dike

The construction of Whale Tail Dike started on July 2018 and ended on February 2019.

The instruments installed on Whale Tail Dike are summarised in Tables 19 and 20 below and consist of:

- 4 inclinometers in the cut-off wall;

- 16 thermistors in the dike;
- 2 thermistors respectively in the upstream lake and downstream pond;
- 9 piezometer holes having each 3 instruments.

Thermistors are mostly located downstream of the cut-off wall with the temporary thermistors installed just downstream of the secant wall to gain more data on potential wall defects that would exhibit warm up in the cut off wall. The piezometers have 2 holes downstream (P1 & P2) of the wall and 1 upstream (P3) for a given section. All the instruments except for the temporary thermistors are connected to an automated data acquisition system that gathers data every 3 hours.

Table 19: List of Piezometers and Thermistors on Whale Tail Dike (source: AEM)

Station	Instrument ID	Drawing Name	Type	Status	Readings	For PZ		For TH	
#	ID		PZ/TH	Operational (✓) / Not operational (×)/Frozen (F)	Manual/ Automatic	Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in m (top/bottom)
0+142	WTD-TH 0+142	TH-1	TH	✓	Automatic (DL101)			11/13	157/145
0+210	WTD-TH 0+210	TH-2	TH	✓	Automatic (DL101)			12/13	157/142
0+260	WTD-TH 0+260	TH-3	TH	✓	Automatic (DL101)			11/13	157/127
0+260	WTD 0+260_P1_A	PZ-1-A	PZ	✓	Automatic (DL101)	138.5	Bedrock		
0+260	WTD 0+260_P1_B	PZ-1-B	PZ	✓	Automatic (DL101)	145.5	Bedrock		
0+260	WTD 0+260_P1_C	PZ-1-C	PZ	F	Automatic (DL101)	150.5	Interface		
0+260	WTD 0+260_P2_A	PZ-2-A	PZ	✓	Automatic (DL101)	138.5	Bedrock		
0+260	WTD 0+260_P2_B	PZ-2-B	PZ	✓	Automatic (DL101)	145.5	Bedrock		
0+260	WTD 0+260_P2_C	PZ-2-C	PZ	✓	Automatic (DL101)	150.5	Interface		
0+260	WTD 0+260_P3_A	PZ-3-A	PZ	✓	Automatic (DL101)	138.5	Bedrock		
0+260	WTD 0+260_P3_B	PZ-3-B	PZ	✓	Automatic (DL101)	145.5	Bedrock		
0+260	WTD 0+260_P3_C	PZ-3-C	PZ	✓	Automatic (DL101)	151.5	Interface		
0+310	WTD-TH 0+310	TH-4	TH	✓	Automatic (DL102)			13	157/127
0+360	WTD-TH 0+360	TH-5	TH	✓	Automatic (DL102)			11/13	157/127
0+360	WTD 0+360_P1_A	PZ-4-A	PZ	✓	Automatic (DL102)	132.0	Bedrock		
0+360	WTD 0+360_P1_B	PZ-4-B	PZ	✓	Automatic (DL102)	139.0	Bedrock		
0+360	WTD 0+360_P1_C	PZ-4-C	PZ	✓	Automatic (DL102)	145.53	Interface		
0+360	WTD 0+360_P2_A	PZ-5-A	PZ	✓	Automatic (DL102)	142.0	Bedrock		

0+360	WTD 0+360_P2_B	PZ-5-B	PZ	✓	Automatic (DL102)	137.0	Bedrock		
0+360	WTD 0+360_P2_C	PZ-5-C	PZ	✓	Automatic (DL102)	144.0	Interface		
0+360	WTD 0+360_P3_A	PZ-6-A	PZ	✓	Automatic (DL102)	132.0	Bedrock		
0+360	WTD 0+360_P3_B	PZ-6-B	PZ	✓	Automatic (DL102)	139.0	Bedrock		
0+360	WTD 0+360_P3_C	PZ-6-C	PZ	✓	Automatic (DL102)	142.8	Interface		
0+407	WTD-TH 0+407	TH-6	TH	✓	Automatic (DL103)			10/13	157/127
0+440	WTD 0+440_P1_A	PZ-7-A	PZ	✓	Automatic (DL103)	137.0	Bedrock		
0+440	WTD 0+440_P1_B	PZ-7-B	PZ	✓	Automatic (DL103)	144.0	Bedrock		
0+440	WTD 0+440_P1_C	PZ-7-C	PZ	✓	Automatic (DL103)	149.0	Interface		
0+440	WTD 0+440_P2_A	PZ-8-A	PZ	✓	Automatic (DL103)	137.0	Bedrock		
0+440	WTD 0+440_P2_B	PZ-8-B	PZ	✓	Automatic (DL103)	144.0	Bedrock		
0+440	WTD 0+440_P2_C	PZ-8-C	PZ	✓	Automatic (DL103)	149.0	Interface		
0+440	WTD 0+440_P3_A	PZ-9-A	PZ	✓	Automatic (DL103)	137.0	Bedrock		
0+440	WTD 0+440_P3_B	PZ-9-B	PZ	✓	Automatic (DL103)	144.0	Bedrock		
0+440	WTD 0+440_P3_C	PZ-9-C	PZ	✓	Automatic (DL103)	149.0	Interface		
0+453	WTD-TH 0+453	TH-7	TH	✓	Automatic (DL103)			13	157/127
0+520	WTD-TH 0+520	TH-8	TH	✓	Automatic (DL103)			13	157/127
0+607	WTD-TH 0+607	TH-9	TH	✓	Automatic (DL104)			10/13	157/127
0+675	WTD-TH 0+675	TH-10	TH	✓	Automatic (DL104)			13	157/142
0+772	WTD-TH 0+772	TH-11	TH	✓	Automatic (DL104)			11/13	157/142
0+190	WTD-TH 0+190 (WA)	TH-12	TH	✓	Automatic (DL101)			13	157/142
0+710	WTD-TH 0+710 (EA)	TH-13	TH	✓	Automatic (DL104)			15/16	157/142
0+750	WTD-TH 0+750 (EA)	TH-14	TH	✓	Automatic (DL104)			16	157/142
0+276	WTD-TH 0+276 (TH-LAKE)	TH-LAKE	TH	✓	Automatic (DL101)			13	157/TBD

Table 20: List of Inclinometers on Whale Tail Dike (source: AEM)

Location	Instrument ID / Drawing Name	Operational (✓)/Not operational (x)	Manual/Automatic	Elevation interval in meters (top/bottom)	Number of reading points
0+205	WTD-SAA-0+205 / INC-1	✓	Automatic	157/143	29
0+369	WTD-SAA-0+369 / INC-2	✓	Automatic	157/139	37
0+560	WTD-SAA-0+560 / INC-3	✓	Automatic	157/141	33
0+730	WTD-SAA-0+730 / INC-4	✓	Automatic	157/142	31

3.1 WRSF Dike

The construction of WRSF Dike occurred from January to February 2019 to maintain the frozen condition of the foundation. Thermistors TH-01 to 03 were installed in March 2019. Four (4) additional thermistors were installed in early October 2019 to monitor more precisely the temperature trends in WRSF Dike in order to study the seepage mechanism after water had been seeping through the dike since August 2019. Two (2) additional thermistors (Th-08 and TH-09) were installed in the constructed upstream thermal berm in 2020.

Table 21 below details instrumentation on WRSF Dike, with the exception of the newest instruments that were shortly installed at the time of the inspection (TH-08 and TH-09).

Table 21: List of Thermistors on WRSF Dike (source: AEM)

Station #	Instrument ID ID	Drawing Name	Type PZ/TH	Status Operational (✓) / Not operational (x)/Frozen (F)	Readings Manual/ Automatic	For PZ Elevation (m)	For PZ Stratigraphic unit	For TH Number of operational beads	For TH Elevation interval in m (top/bottom)
0+120	WRSF-19-01	TH-01	TH	✓	Automatic (DL105)			13/13	139/123
0+120	WRSF-19-02	TH-02	TH	✓	Automatic (DL105)			13/13	159/147
0+120	WRSF-19-03	TH-03	TH	✓	Automatic (DL105)			13/13	155/143
0+093	WRSF-19-04	TH-04	TH	✓	Automatic (DL105)			13/13	158/142
0+135	WRSF-19-05	TH-05	TH	✓	Automatic (DL105)			13/13	154/142
0+135	WRSF-19-06	TH-06	TH	✓	Automatic (DL105)			13/13	156/143
0+172	WRSF-19-07	TH-07	TH	✓	Automatic (DL105)			13/13	155/142

3.2 Mammoth Dike

The construction of Mammoth Dike occurred from February 2019 to March 2019 to maintain the frozen condition of the foundation.
There are three (3) thermistor strings installed within Mammoth Dike.

Table 22 below details instrumentation on Mammoth Dike.

Table 22: List of Thermistors on Mammoth Dike (source: AEM)

Station	Instrument ID	Drawing Name	Type	Status	Readings	For PZ		For TH	
#	ID		PZ/TH	Operational (✓) / Not operational (×)/Frozen (F)	Manual/ Automatic	Elevation (m)	Stratigraphic unit	Number of operational beads	Elevation interval in m (top/bottom)
0+143	MD-19-01	TH-01	TH	✓	Automatic (DL106)			13/13	139/123
0+143	MD-19-02	TH-02	TH	✓	Automatic (DL106)			13/13	155/143
0+143	MD-19-03	TH-03	TH	✓	Automatic (DL106)			13/13	154/142



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